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A N A C O N D A

TRAFFIC STUDY

SUMMARY REPORT

Prepared by

MONTANA DEPARTMENT OF HIGHWAYS

PLANNING AND RESEARCH BUREAU

in cooperation with

CITY OF ANACONDA

COUNTY OF DEER LODGE

and

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

1973-1993

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CHAPTER 1

INTRODUCTION

Chapter I

I N T R O D U C T I O N

COMPREHENSIVE PLAN

Comprehensive plans have been written for the city of Anaconda in 1969 and for Deer Lodge County in 1973. Both of these plans discussed goals and objectives, population, community facilities, housing, utilities, land use and thoroughfares. The purpose of this study is to elaborate on the transportation facilities for the Anaconda Urban Area. It is proposed to describe existing transportation facilities, investigate various alternate improvements and propose a plan which will provide for the transportation needs of 1995.

The Deer Lodge County Comprehensive Plan recommends a network of primary, secondary arterial and collector streets plus a truck bypass. It indicated that a closing of Park Avenue in the Central Business District was being considered. Since the publication of the plan, the redevelopment of the C B D has been finalized as to its extent. This new C B D area would include the area between Commercial and Third Street and Oak and Chestnut Streets. This will require a reroute of Park Avenue to detour the closed portion of this street around the new Mall.

GOALS AND OBJECTIVES

The Comprehensive Plan stated that the goal of a transportation facility should be: "to provide Deer Lodge County residents and tourists

with safe, efficient ground transportation, and to provide adequate highway and rail freight service. Specifically, it should be the goal of county residents, (1) to bring all primary, secondary and county roads in the county up to accepted standards of safety and convenience of traffic flow, (2) to maintain adequate freight service between Anaconda and other cities in Montana and out of State." This study will propose a plan to accomplish these objectives in so far as the ground transportation facilities may be improved with anticipated financial resources.

STUDY AREA

The urban study area for Anaconda is delineated in Figure I-1. It includes the incorporated limits of the city of Anaconda in addition to the Anaconda Company Smelter and the West Valley area. This same area has an estimated 1970 population of 12,397. The corporate limits of Anaconda accounting for 9771¹ and the West Valley area, 2626². For a more detailed analysis on population for Anaconda and vicinity refer to the Deer Lodge County Comprehensive Planning Program, County-Wide Plan Report by Northwest Planners Inc.

NEED FOR PLANNING

Transportation planning is merely one aspect of planning which should maximize the benefits while minimize the cost of moving people and goods. The transportation system requires considerable land and a large investment of money to build and maintain the facilities which make up the transportation

¹U.S. Department of Commerce, Bureau of the Census, Census of Population, Montana 1970.

²Deer Lodge County Comprehensive Planning Program, County-Wide Plan Report, Northwest Planners Inc., June 1973.

ANACONDA TRAFFIC STUDY
STUDY AREA

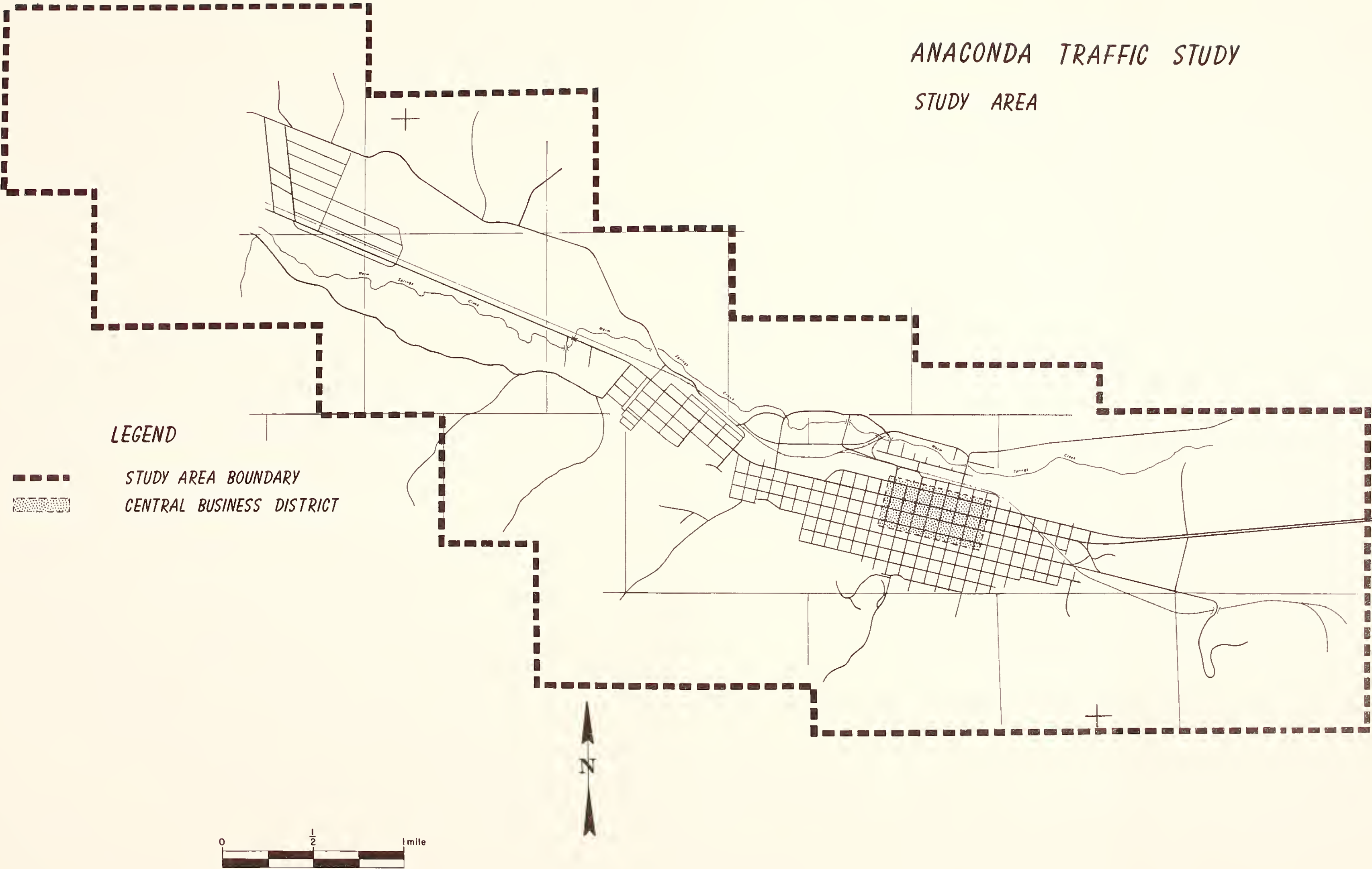


FIG. 1-1

system. The interrelation of land use and the transportation system is usually closer than is realized. For instance, a rural tract of land can be used for agricultural purposes if there is a road to get machines to work the land and to remove the products produced to markets in the cities and towns. If a tract of land is developed as residential, then the roads serving it will have more traffic and will require a higher design standard. The higher intensity of land use will require a transportation system of greater complexity and cost to serve this land use.

Urban areas serve as hubs of activity for the surrounding rural area as well as the activity in the urban area itself. The volume of traffic on the transportation system is highest in urban areas because of this higher level of activity of land use.

CHAPTER 11

TRAFFIC AND TRAVEL CHARACTERISTICS

Chapter II

T R A F F I C

A N D

T R A V E L

C H A R A C T E R I S T I C S

FUNCTIONALLY CLASSIFIED SYSTEM

Figure II-1 illustrates the major street network functioning at the present time in Anaconda. This transportation study network generally conforms to the 1968 functional classification of streets and highways for Anaconda and vicinity.

The 1968 Functional Classification was a result of the Federal-Aid highway classification study to be made in cooperation with the Department of Highways and local governments. Because classification criteria set forth in the 1968 Functional Classification Study Manual^{*} corresponds generally with like classifications as defined by the National Committee on Urban Transportation (NCUT), the street usage, classification and definitions in this study are based on the 1968 Functional Classification Study criteria.

A street, highway or road basically has two functions. One is to allow movement of vehicles throughout the urban area--traffic mobility. The other is to allow the motorist to reach a desired destination--access

* Prepared by the U.S. Department of Transportation, Federal Highway Administration.

ANACONDA TRAFFIC STUDY

EXISTING STREET NETWORK

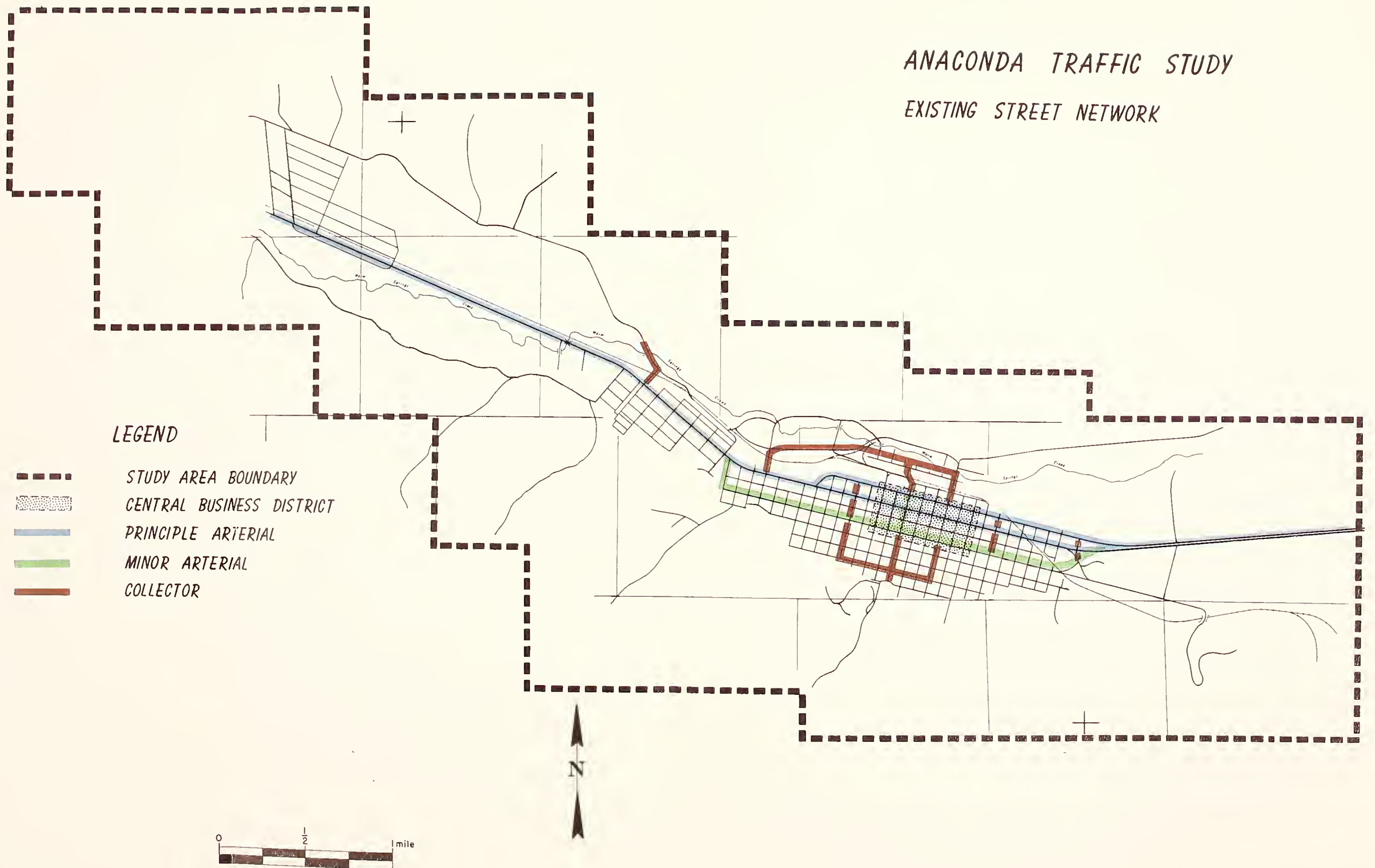


FIG. II-1

to property. Varying degrees of emphasis on these two functions form the basis for functional classification. The relationship is illustrated by Figure II-2.

The main categories of classification are principal arterial, minor arterial, collector and local streets. These classifications make up the major street network for the Anaconda Transportation Study. Local streets are generally considered outside the scope of the transportation study and therefore, not considered in this report except for classification purposes.

Principal Arterials: This classification serves the major traffic corridor movements entering, leaving or moving within the urban area. The principle arterial's function is to move traffic. In instances where traffic volumes are high, limited land access or controlled points of

RELATIONSHIP BETWEEN SYSTEMS - MOBILITY - ACCESS

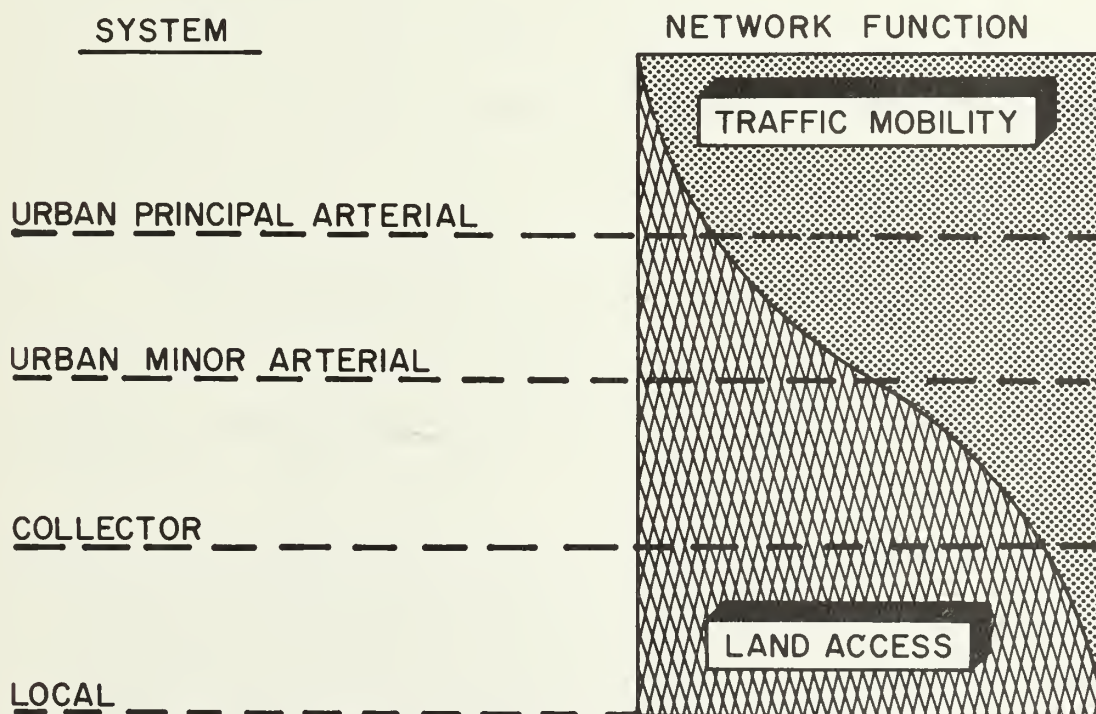


FIG. II-2

intersection may be necessary. This system should serve major urban area traffic generators, the longer trip desires, and should carry a large portion of the total urban area travel on a minimum number of miles.

Minor Arterials: Functioning much the same as principal arterials, minor arterials interconnect the lesser important trip generators within the urban area and provide some rural access links. This secondary system provides service to trips of moderate length at a somewhat lower level of travel mobility than major arterials.

Collectors: As the name implies, this type of facility "collects" traffic from local streets and feeds it to arterial routes. They should also serve traffic and land access to an equal extent. Collectors also serve as connecting links between neighborhoods.

Local Streets: The principle function of a local street is to provide access to abutting land and access to the higher order systems. This local street system comprises all facilities not classified under one of the afore mentioned classifications. A large portion of the total street mileage is made up of local streets.

Spacing: Spacing between the different classifications should be at specified intervals in order to allow a transportation network to function properly. This is desirable and should be attained whenever possible. However, because of certain traffic demands, it is sometimes necessary to vary these intervals to some extent.

Arterials should form a general grid with intervals of one mile and the spacing of collectors at approximately every half mile interval. Local streets should be placed wherever necessary to provide land access.

Continuity: To furnish adequate service to moving vehicles, a route must be continuous. This is particularly true of arterial streets where

irregular routings reduce effectiveness. Long routes for collector streets are to be avoided; this should be the function of arterials. Local streets offer the lowest level of mobility. Service to through traffic movement usually is deliberately discouraged.

TRAFFIC VOLUMES

Data on traffic volumes are basic to the proper evaluation of almost every study pertaining to transportation facilities. In the following sections of this study, traffic volume information will aid in the analysis of the existing street system under such considerations as traffic accidents, travel studies and recommended improvements. A comparison of past and present traffic volume data furnishes information on trends which are basic to planning for future needs.

Current traffic volume information was collected in connection with the Origin-Destination Survey conducted during the summer months of 1973. Twenty-four hour traffic volume counts were obtained by automatic counters at strategic locations throughout the study area. These counts reflect the average daily traffic volumes observed during the period of the O-D Survey.

Table II-1 presents average daily traffic volumes at 12 selected locations in the Anaconda downtown area and the immediate outlying area for years 1956, 1964 and 1973. Over this 18 year period, traffic volumes increased appreciably in Anaconda. However, as shown in Table II-1 there are decreases shown at some count locations on Park Avenue, Commercial Avenue and Fourth Street from 1956 to 1973. In comparing 1964 counts to 1973 counts all 12 locations show a substantial increase. An explanation to this is that in 1961, Park Avenue and Commercial Avenue were designated a one-way couplet, re-distributing traffic in the

AVERAGE DAILY TRAFFIC VOLUMES

AT SELECTED LOCATIONS

TABLE II-1

	1956	1964	1973	% Change 1956-1973
Park Ave. West between Evergreen & Tamerack	2100	2170	6190	194.8
Park Ave. West-between Larch & Cottonwood	4860	5980	7250	49.2
Park Ave. between Main and Oak Street	8840	5980	9240	4.5
Park Ave. between Cedar & Chestnut St.	8120	5160	7750	-4.6
Park Ave. between Adams & Jefferson	4880	4180	5310	8.8
Park Ave. East-just east of E. City Limits	4510	3930	6532	44.8
Comm. Ave.-between Adams & Washington	1680	4370	6070	261.3
Comm. Ave.-between Chestnut & Cedar St.	3230	5120	6620	105.0
Comm. Ave.-between Oak and Main Street	6610	5160	5560	-15.9
Fourth St.-between Cherry & Oak St.	4310	3360	3860	-10.4
Fourth St.-between Elm & Pine St.	2990	2440	2750	-8.0
Fourth St.-between Palmetto & Cypress	1740	1330	1680	-3.5

downtown area. Figure II-3 represents a distribution of traffic volumes on the existing major street network throughout the study area. The width of the band represents the average annual daily traffic on the street network.

ANACONDA TRAFFIC STUDY

1973 TRAFFIC VOLUMES

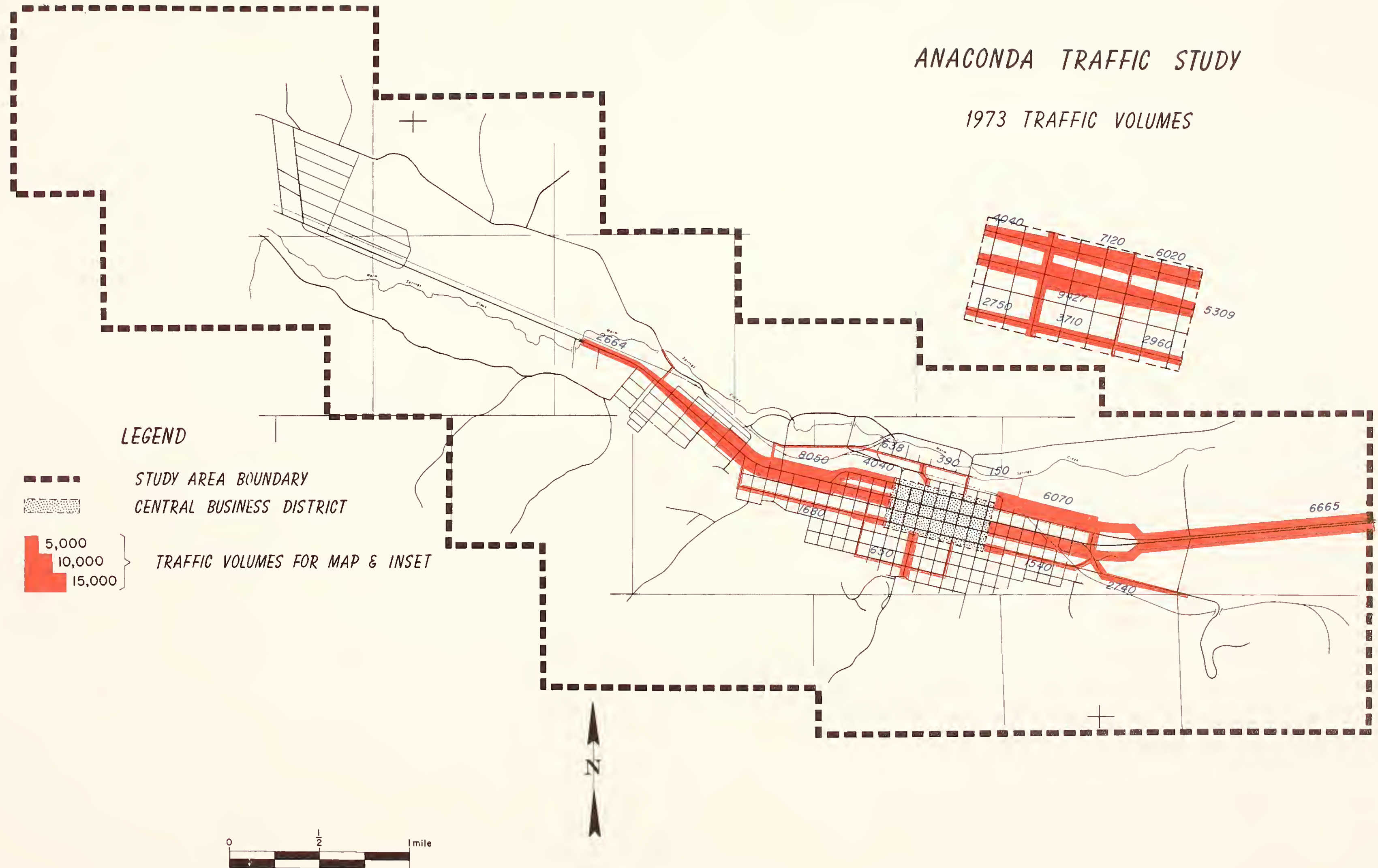


FIG. II-3

TRAFFIC ACCIDENTS

The purpose of this study is to analyze the various parts of the existing Major Street System in the Anaconda Urban Transportation Study Area in terms of the frequency and cause of accidents. This analysis will determine the more hazardous locations on the system and provide a basis for planning improvements which will tend to reduce the frequency of accidents.

During the analysis period 1970-1972 there were approximately 689 traffic accidents within the city of Anaconda. Of these, approximately 68 resulted in personal injury, and one resulted in a fatality.

The accident survey consisted of a tabulation of City accident records for the years 1970, 1971, 1972. Based upon an accident location map, the five highest accident locations having an average of five or more accidents over this ~~three~~ year period were selected for this analysis. Figure II-5 illustrates these locations and the average total accidents occurring at each location. The records for these locations were examined in detail and accident collision diagrams were prepared. See Figures II-6 through II-10 for these diagrams.

The city of Anaconda accident records revealed that there were 111 accidents at these five intersections from 1970-1972. Further data showing total property damage, personal injury, and fatal accidents in Anaconda, compiled for the period 1970-1972 for the five high accident locations, are indicated in Table II-2. Statistical data for these tables and charts was obtained from the records of the Anaconda Police Department.

Intersection accidents were summarized to give the number of yearly accidents per intersection. Those intersections with an average of five or more accidents from 1970-1972 are shown in Table II-3. Also, the accidents per one million vehicles entering each of these intersections

ACCIDENTS BY TYPE
FOR THE
HIGH ACCIDENT INTERSECTIONS

TABLE II-2

Type of Accident	1970	1971	1972	TOTAL
Property Damage Only	34	37	35	106
Injuries	3	1	----	4
Fatalities	----	1	----	1
Totals	37	39	35	111

INTERSECTIONS HAVING AN AVERAGE OF
FIVE ACCIDENTS FROM 1970-1972

TABLE II-3

Intersection	Accidents Per Year			Average 1970-1972	Ave. No. Acc. * 1970-1972
	1970	1971	1972		
Park and Main	9	11	17	12	3.5
Park and Birch	5	8	5	6	1.9
Park and Cherry	10	7	5	7	2.2
Park and Cedar	7	5	3	5	1.7
Park and Oak	6	8	5	6	1.6
Totals	37	39	35		

* Per one million vehicles entering intersection.

are shown in this same table. The rate of accidents per one million vehicles permits comparison of the relative accident frequencies based on a common exposure factor. This same type information is illustrated in Figure II-4.

In using the one million vehicle mile basis, the assumption is made that the traffic accident exposure is directly related to the vehicle miles of travel. Accident rates based on vehicle miles of travel are an accurate measure of the relative degree of hazard; however, sometimes low volume streets create high values and tend to magnify the significance of a few accidents. Table II-3 summarizes, accident data per year for 1970-1972, the average number of accidents for the three years, and an accident rate for each of the five intersections selected for this analysis.

As would be expected, the highest accident intersections in Anaconda occur along the major highway routes through the city where the highest traffic volumes are experienced. Of the five highest accident intersections, all five are along Park Avenue. The intersection of Park Avenue and Main Street averaged 12 accidents for the 1970-1972 period and was followed by the intersection of Park and Cherry Street having an average of seven accidents.

Of the total number of accidents occurring during these three years at the five locations, 33 percent occurred at Park and Main Street. The most common type of accident at this intersection involved rear-end collisions. From 1970-1972 there were 16 rear-end collisions which accounted for 46 percent of all accidents at this locations. The high incident of this type accident is due to the tendency to maintain a higher speed to try to clear the green light without stopping, and the amber time of the cycle being short. While at a STOP intersection,

TRAFFIC ACCIDENT RATE FOR THE FIVE HIGH ACCIDENT LOCATIONS

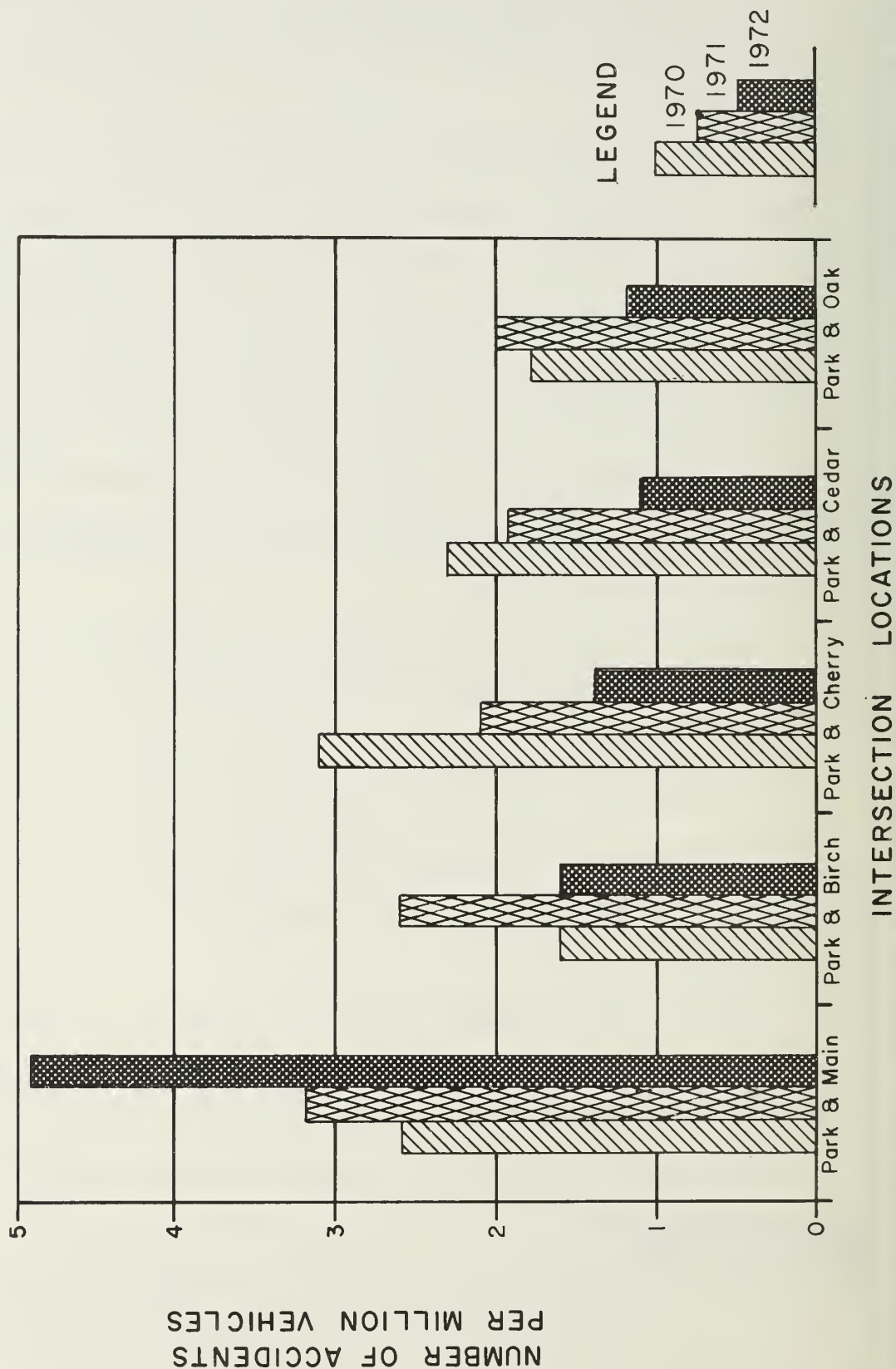


FIG. II-4

a STOP is always required.

The second most common accident was the backing collision with six occurring at Park Avenue and Main Street over this same period. A contributing cause to this type accident is the angle parking on Main Street and on Birch Street. Vehicles approaching these intersections are colliding with vehicles deparking.

During the analysis period, at the five intersections under consideration, there have been two pedestrians injured by an approaching vehicle, of which one pedestrian was fatally injured. A possible explanation for accidents of this type, is the fact that vehicles are parking right next to the pedestrian cross-walks restricting the sight distance of the pedestrian to the approaching vehicle and conversely so for the vehicles to the pedestrians.

There is a state law regulating the distance vehicles can park to pedestrian cross-walks. It requires a distance be maintained of 20 feet from the cross-walk to parked vehicle at an intersection having no traffic control device. For an intersection having traffic control, a distance of 30 feet from cross-walk to parked vehicle is to be maintained.

This study has identified and listed the higher accident intersections within the city. Through accident records, a serious attempt has been made to present a comprehensive approach to the accident picture in the city of Anaconda within the past few years. Recommendations relative to the increased safety on the major street system and its associated sections will be discussed in the chapter "Recommended Transportation Plan."

The policy of the Anaconda Police Department is to have people involved in a traffic accident fill out an accident report and mail

back to the Department, this being the only record source in determining traffic accident particulars. In reviewing these accident records for this study many were found to be ambiguous as to what had been the cause of the accident with collision course diagrams having been omitted.

It is the recommendation of this study that the City Police Department use a standard accident report form and send a copy, filled out in detail, of all accidents to the State Highway Patrol as specified by State law.

ANACONDA STUDY AREA HIGH ACCIDENT LOCATIONS

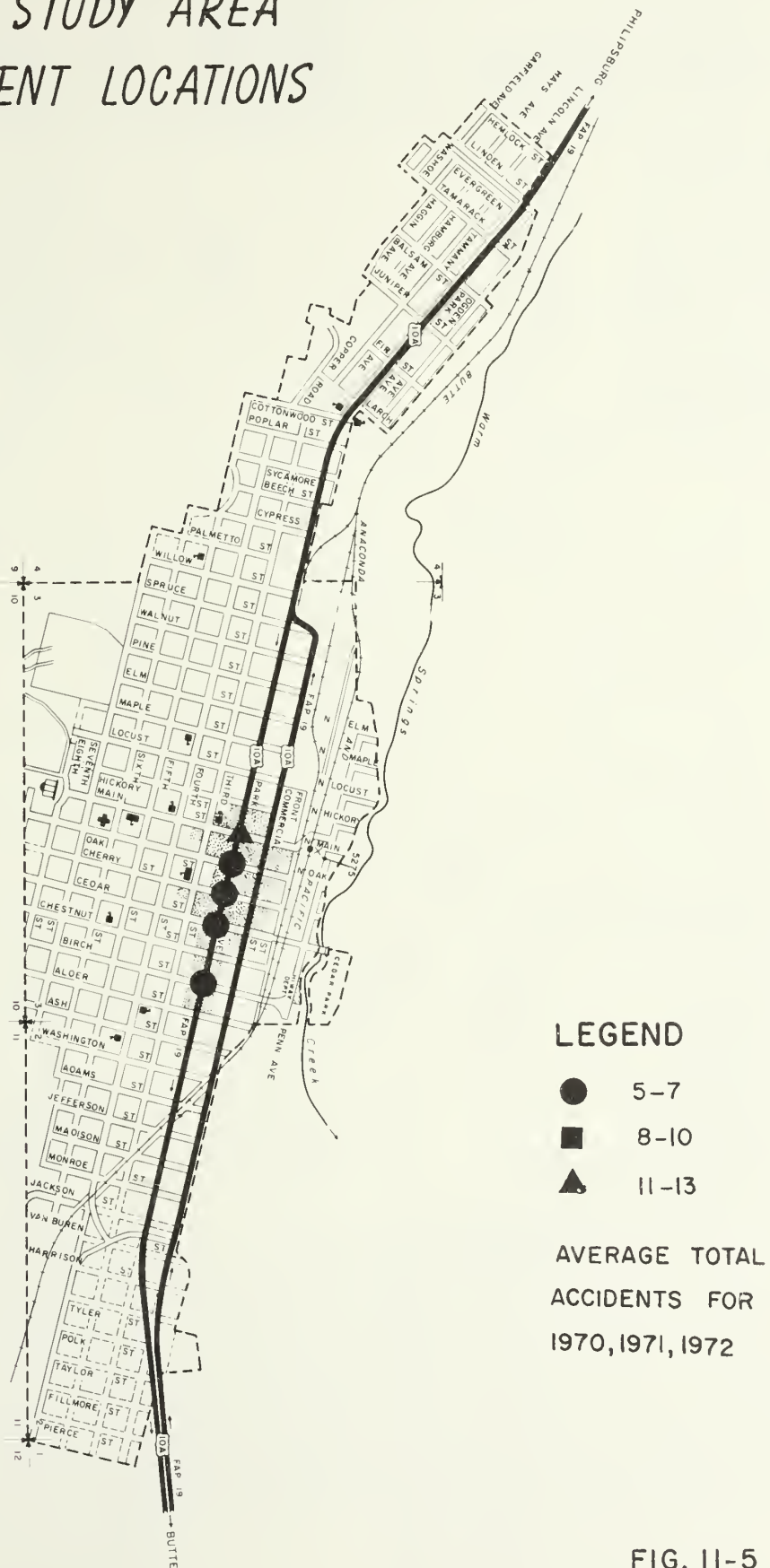


FIG. II-5

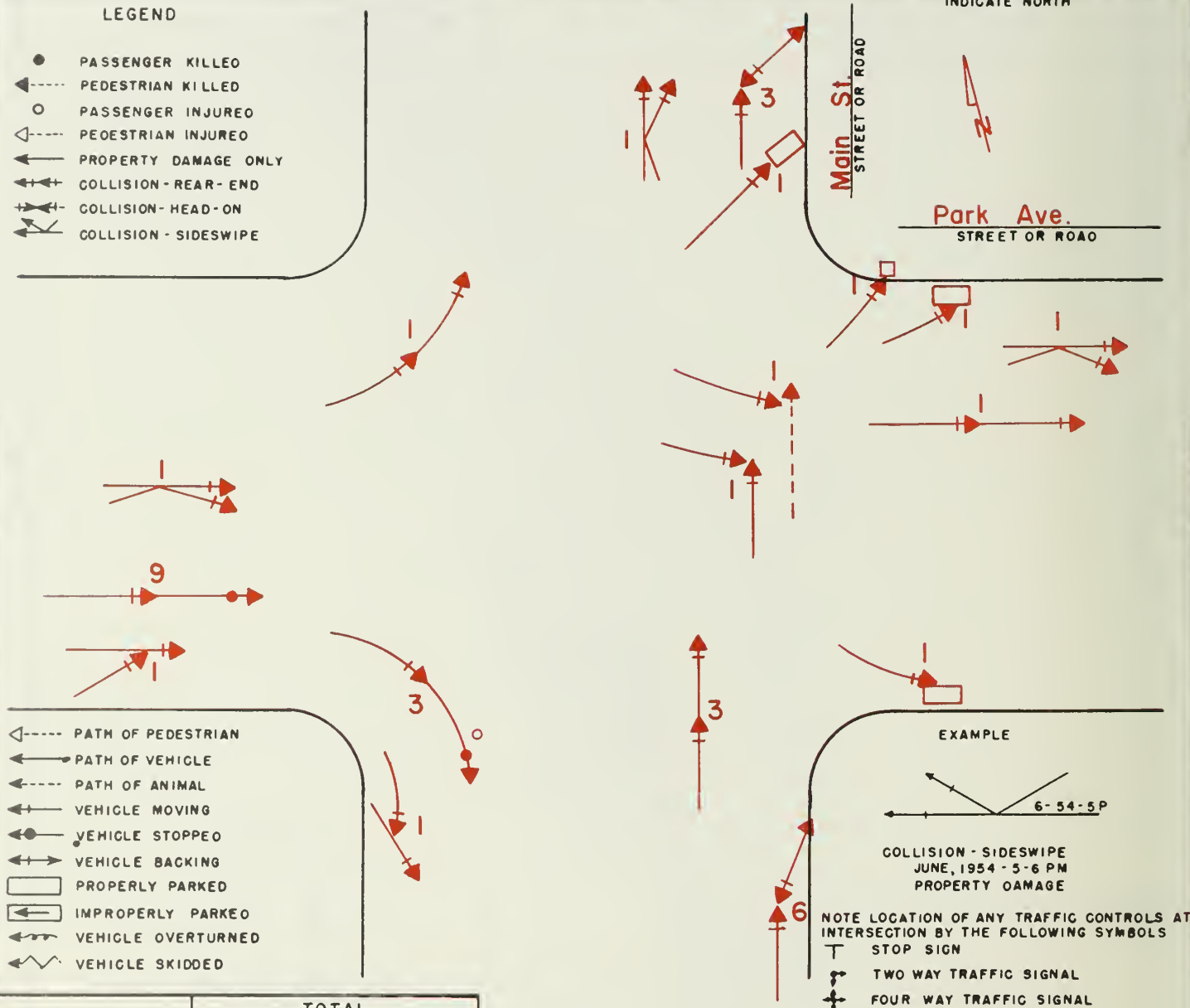
MONTANA HIGHWAY COMMISSION
TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS
COLLISION DIAGRAM

CITY OF Anaconda COUNTY Deer Lodge
INTERSECTION OF Main St. AND Park Ave.
HIGHWAY NUMBER _____
PERIOD COVERED 1970, 1971, 1972
COMPILED BY _____ DRAWN BY _____ DATE _____

LEGEND

- PASSENGER KILLED
- ◄----- PEDESTRIAN KILLED
- PASSENGER INJURED
- ◄----- PEDESTRIAN INJURED
- ←----- PROPERTY DAMAGE ONLY
- ◄+----- COLLISION - REAR - END
- +----- COLLISION - HEAD - ON
- ◄+----- COLLISION - SIDESWIPE

INDICATE NORTH



COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP. DAMAGE	TOTAL
ANGLE			3	3
HEAD - ON				
REAR - END		1	16	17
SIDESWIPE				
TURNING MOVEMENT			1	1
PARKING			2	2
NON-COLLISION				
FIXED OBJECT			4	4
PEDESTRIAN	1			1
BACKING			9	9
MISC.				
TOTAL	1	1	35	37

REMARKS _____

FIG. II-6

MONTANA HIGHWAY COMMISSION
TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS
COLLISION DIAGRAM

CITY OF Anaconda COUNTY Deer Lodge
INTERSECTION OF Park Ave. AND Birch St.
HIGHWAY NUMBER _____
PERIOD COVERED 1970, 1971, 1972
COMPILED BY _____ DRAWN BY _____ DATE _____

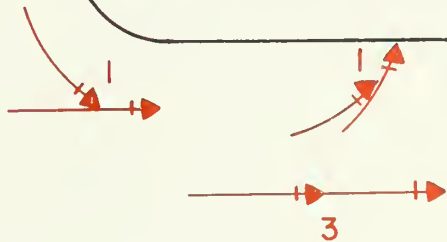
LEGEND

- PASSENGER KILLED
- ◄----- PEDESTRIAN KILLED
- PASSENGER INJURED
- ◄----- PEDESTRIAN INJURED
- ← PROPERTY DAMAGE ONLY
- ←+← COLLISION - REAR-END
- +--+ COLLISION - HEAD-ON
- ←+↔ COLLISION - SIDESWIPE

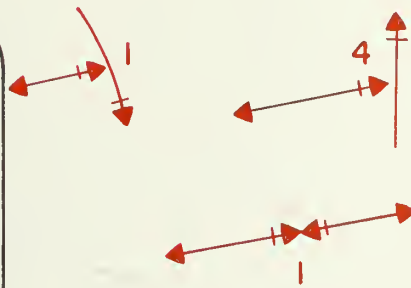
INDICATE NORTH

Birch St.
STREET OR ROAD

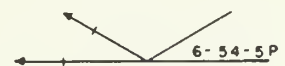
Park Ave.
STREET OR ROAD



- ◄----- PATH OF PEDESTRIAN
- ←+→ PATH OF VEHICLE
- ◄----- PATH OF ANIMAL
- ←+→ VEHICLE MOVING
- VEHICLE STOPPED
- ←+→ VEHICLE BACKING
- PROPERLY PARKED
- ◄+→ IMPROPERLY PARKED
- ←+→ VEHICLE OVERTURNED
- ←+→ VEHICLE SKIDDED



EXAMPLE



COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT
INTERSECTION BY THE FOLLOWING SYMBOLS

- ⊥ STOP SIGN
- ⊕ TWO WAY TRAFFIC SIGNAL
- ⊕ FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP. DAMAGE	TOTAL
ANGLE				
HEAD-ON				
REAR-END			10	10
SIDESWIPE				
TURNING MOVEMENT			2	2
PARKING				
NON-COLLISION				
FIXED OBJECT				
PEDESTRIAN				
BACKING			6	6
MISC.				
TOTAL			18	18

REMARKS _____

FIG. 11-7

MONTANA HIGHWAY COMMISSION
TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS
COLLISION DIAGRAM

CITY OF Anaconda COUNTY Deer Lodge
INTERSECTION OF Park Ave. AND Cherry St.
HIGHWAY NUMBER _____
PERIOD COVERED 1970, 1971, 1972
COMPILED BY _____ DRAWN BY _____ DATE _____

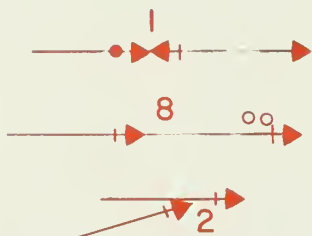
LEGEND

- PASSENGER KILLED
- ◄----- PEDESTRIAN KILLED
- PASSENGER INJURED
- ◄----- PEDESTRIAN INJURED
- ← PROPERTY DAMAGE ONLY
- ⇄ COLLISION - REAR- END
- ⇄ COLLISION - HEAD-ON
- ⇄ COLLISION - SIDESWIPE

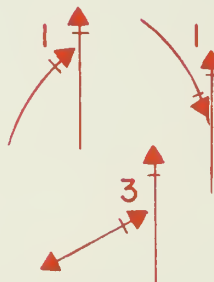
INDICATE NORTH

Cherry St.
STREET OR ROAD

Park Ave.
STREET OR ROAD



- ◄----- PATH OF PEDESTRIAN
- ← PATH OF VEHICLE
- ◄----- PATH OF ANIMAL
- ← VEHICLE MOVING
- VEHICLE STOPPED
- ⇄ VEHICLE BACKING
- PROPERLY PARKED
- ◄◄ IMPROPERLY PARKED
- ~ VEHICLE OVERTURNED
- ~ VEHICLE SKIDDED



EXAMPLE



COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS
T STOP SIGN
⇄ TWO WAY TRAFFIC SIGNAL
⇄ FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE				
HEAD-ON				
REAR-END		2	8	10
SIDESWIPE				
TURNING MOVEMENT			4	4
PARKING			2	2
NON-COLLISION				
FIXED OBJECT				
PEDESTRIAN				
BACKING			6	6
MISC.				
TOTAL		2	20	22

REMARKS _____

FIG. II-8

TRAFFIC DEPARTMENT
ACCIDENT ANALYSIS

CITY OF Anaconda COUNTY Deer Lodge
INTERSECTION OF Park Ave. AND Cedar St.
HIGHWAY NUMBER _____
PERIOD COVERED 1970, 1971, 1972
COMPILED BY _____ DRAWN BY _____ DATE _____

●	PASSENGER KILLED
◄-----	PEDESTRIAN KILLED
○	PASSENGER INJURED
◄-----	PEDESTRIAN INJURED
←	PROPERTY DAMAGE ONLY
←+ +←	COLLISION - REAR - END
+ + +←	COLLISION - HEAD - ON
←+ +←	COLLISION - SIDESWIPE

INDICATE NORTH

Cedar St.
STREET OR ROAD

Park Ave.

STREET OR ROAD

The diagram illustrates the flow of water from a reservoir into a river channel. The flow is indicated by arrows and labeled with '1' and '2' at different points along the channel. The flow starts from the reservoir on the left and moves towards the right, where it enters the river channel. The flow is labeled '1' at the point of entry and '2' at a point further downstream. The flow is also labeled '2' at the point where the flow enters the river channel. The flow is indicated by arrows and labeled with '1' and '2' at different points along the channel.

A horizontal number line with arrows at both ends. Two vertical tick marks are present. The segment between these two tick marks is highlighted in red. Above the right tick mark is a red number 3.

-  PATH OF PEDESTRIAN
-  PATH OF VEHICLE
-  PATH OF ANIMAL
-  VEHICLE MOVING
-  VEHICLE STOPPED
-  VEHICLE BACKING
-  PROPERLY PARKED
-  IMPROPERLY PARKED
-  VEHICLE OVERTURNED
-  VEHICLE SKIDDED

EXAMPLE

COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT
INTERSECTION BY THE FOLLOWING SYMBOLS

 STOP SIGN
 TWO WAY TRAFFIC SIGNAL
 FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP DAMAGE	TOTAL
ANGLE		1	1	2
HEAD - ON				
REAR - END			3	3
SIDESWIPE				
TURNING MOVEMENT			6	6
PARKING			2	2
NON-COLLISION				
FIXED OBJECT			1	1
PEDESTRIAN				
BACKING			1	1
MISC.				
TOTAL		1	14	15

REMARKS _____

FIG. 11-9

MONTANA HIGHWAY COMMISSION

TRAFFIC DEPARTMENT ACCIDENT ANALYSIS

COLLISION DIAGRAM

CITY OF Anaconda COUNTY Deer Lodge

INTERSECTION OF Park Ave. AND Oak St.

HIGHWAY NUMBER _____

PERIOD COVERED 1970, 1971, 1972

COMPILED BY _____ DRAWN BY _____ DATE _____

LEGEND

- PASSENGER KILLED
- ◄--- PEDESTRIAN KILLED
- PASSENGER INJURED
- ◄--- PEDESTRIAN INJURED
- ← PROPERTY DAMAGE ONLY
- ⇄ COLLISION - REAR-END
- ⇄ COLLISION - HEAD-ON
- ⇄ COLLISION - SIDESWIPE

INDICATE NORTH

Oak St.
STREET OR ROAD

Park Ave.
STREET OR ROAD

- ◄--- PATH OF PEDESTRIAN
- ← PATH OF VEHICLE
- ◄--- PATH OF ANIMAL
- ← VEHICLE MOVING
- VEHICLE STOPPED
- ⇄ VEHICLE BACKING
- PROPERLY PARKED
- ◄◄ IMPROPERLY PARKED
- ⇄ VEHICLE OVERTURNED
- ~ VEHICLE SKIDDED

EXAMPLE



COLLISION - SIDESWIPE
JUNE, 1954 - 5-6 PM
PROPERTY DAMAGE

NOTE LOCATION OF ANY TRAFFIC CONTROLS AT INTERSECTION BY THE FOLLOWING SYMBOLS

- ⊥ STOP SIGN
- ⚡ TWO WAY TRAFFIC SIGNAL
- ⚡ FOUR WAY TRAFFIC SIGNAL

COLLISION TYPE	TOTAL			
	FATAL	INJURY	PROP. DAMAGE	TOTAL
ANGLE			2	2
HEAD-ON				
REAR-END		1	5	6
SIDESWIPE				
TURNING MOVEMENT			6	6
PARKING				
NON-COLLISION				
FIXED OBJECT				
PEDESTRIAN		1		1
BACKING		1	3	4
MISC.				
TOTAL		3	16	19

REMARKS _____

FIG. 11-10

TRAFFIC CONTROL DEVICES

In 1972 Clete Daily and Associates made an inventory of traffic control devices in the city of Anaconda. This inventory disclosed that most of these devices in the city are deficient with respect to either design, shape or size. Besides being deficient in meeting the requirements of the Manual on Uniform Traffic Control Devices, many of the signs were in need of replacement or repair because of age or vandalism.

Eighty percent of all the inventoried signs were Stop (R1-1) signs. This sign is undoubtedly one of the most important signs with respect to safety. If this sign is missing, mounted improperly, or the reflectivity of the sign is deficient, then the possibility of an angle collision is much greater.

The Anaconda urban network is a system of arterials and collectors which are the main streets of this urban area. Each arterial or collector should be given the right-of-way by installation of a stop sign to stop the traffic from the intersecting street. It is estimated that it will take 180 stop signs to provide this right-of-way protection to the recommended urban system. It is recommended that the network be inventoried to determine if the intersecting streets do have a stop sign installed and if so, if the sign is adequate in so far as color, shape, size and reflectivity. A permanent record of each sign installation should be made in order that city crews can determine sign replacement needs on an annual basis and record the repair or replacement of a sign to its inventory record.

Another type of regulatory sign that requires care both before and after installation is the speed limit sign. Speed zones are required to control speeds in urban areas and other areas of special hazards. Speed zones should be established on the basis of an engineering and

traffic investigation. This investigation should take into consideration a significant sample of speeds, the geometrics of the roadway, accident history and the road side culture. It is recommended that the speed zones along Park Avenue and Commercial be reviewed.

Traffic Signals in Anaconda were also inventoried. There were eight intersections which were controlled by flashing red beacons used to control traffic during fire runs. The traffic signals in Anaconda are all sub-standard and need to be updated or removed depending upon need. See Figure II-11 for these traffic signal locations.

PARKING

The consulting firm of Clete Daily and Associates, in 1972, conducted a parking study¹ within the main retail area of the Anaconda Central Business District. Findings from the study revealed a deficiency of 242 parking spaces in the CBD. The study further indicated that there are 369 metered on-street parking spaces and 291 off-street parking spaces. Of the 291 off street parking spaces, 175 are private, leaving 116 available to the public. Presently, a 485 vehicle parking capacity exists in the Anaconda CBD. Future requirements show a need for 727 parking spaces. Two additional off-street parking lots-one on Fifth Street and one on Third Street-have been planned to aid in reducing the 242 parking space deficiency. However, of the two proposed lots only the Third Street parking lot, providing 57 additional parking spaces, will have a direct effect on future parking demands in the CBD.

¹Traffic Circulation and Parking Report, Anaconda, Montana, Clete Daily and Associates, Helena, Montana, July, 1972.

TRAFFIC SIGNAL LOCATIONS

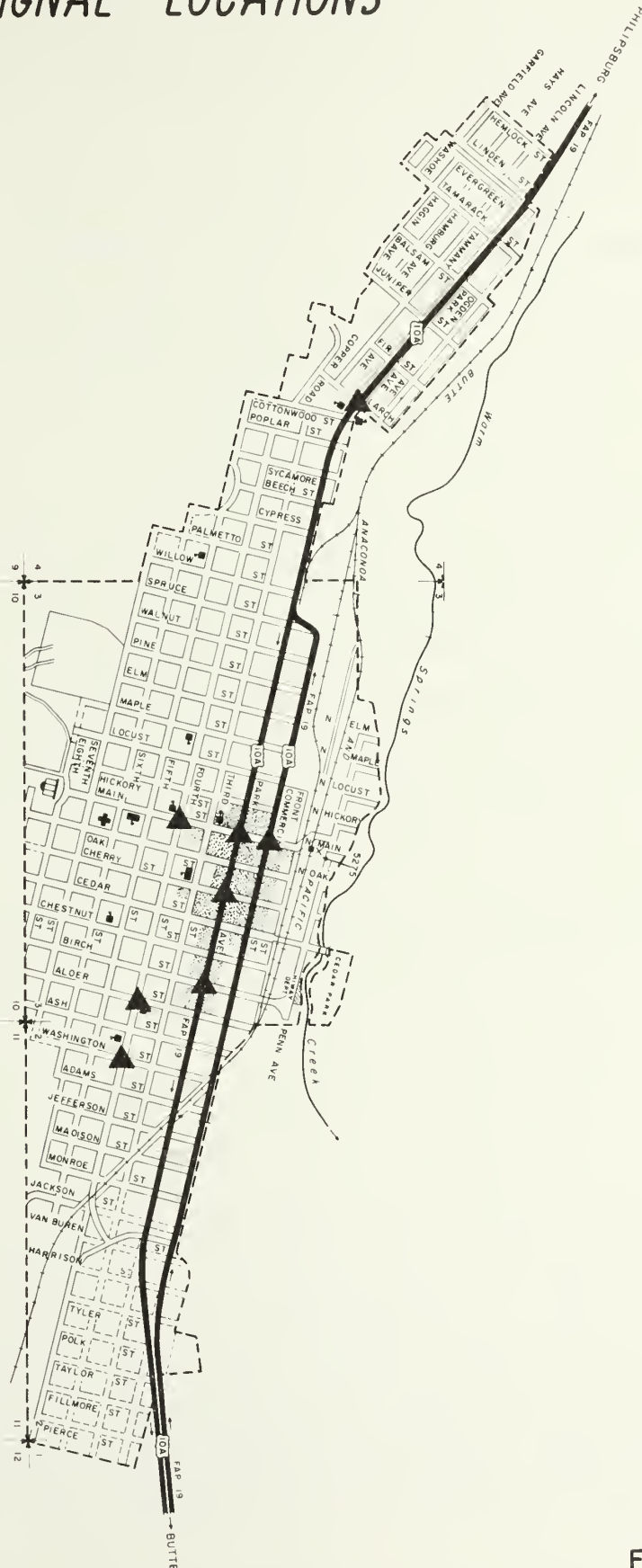


FIG. II-II

An enclosed Mall complex providing both retail floor space and office floor space is planned for downtown Anaconda. The Mall Layout and associated parking was obtained from map displays furnished by the Knight and Company Architects and Engineers of Great Falls, Montana.

With the aid of the above mentioned map displays, the number of parking spaces that could be provided by the available open area around the Mall complex was computed. The computations allowed for parking stall dimensions of nine by eighteen feet, layed out at a 45 degree angle with one-way aisle. No parking was permitted next to the Mall or any other building within the complex area.

Under the above criteria a total of 528 parking spaces can be layed out within the Mall area. In addition, a total of 124 curb parking spaces can be layed out along the outside curb line of the Mall area, providing a total Mall parking capacity of 652 parking spaces.

The total gross floor space of the Mall and other businesses surrounding the Mall complex are as follows:

Mall - - - - -	170,000 sq. ft.
Office Space Second Floor of Mall- - - - -	40,000 sq. ft.
Mountain States Telephone- - - - -	8,230 sq. ft.
Duval Wallace Hardware - - - - -	6,440 sq. ft.
First Security Bank - - - - -	2,600 sq. ft.
Mountain View Clinic - - - - -	<u>3,820 sq. ft.</u>
	231,090 sq. ft.

The parking demand can be estimated as twice the area of the commercial floor space. Each parking space will consume 300 feet of ground area; therefore, the Mall area will need 1,540 parking spaces ($231,090 \times 2 \div 300 = 1540$). The parking supply is less than one half the parking demand. There are two parking lots immediately west of the

proposed Mall with a combined parking capacity of 173 spaces. Curb parking spaces accross the street from the Mall would amount to 96, providing a total parking supply for the Mall and associated facilities of 921 spaces.

Those block faces where angle parking is allowed can legally accomodate 19 parked cars. If parallel parking is instituted, the same block face can accomodate 11 cars, thus a net loss of 8 parking spaces. The reroute of Park Avenue around the Mall will require parallel parking on two block faces of Oak Street, a loss of 16 spaces. The traffic signal project at Park and Main will require parallel parking to be instituted along Main for one half a block each side of Park Avenue, or a net loss of eight spaces and two additional spaces for the right turn lanes. The improvement of the intersection of Park Avenue and Birch Street will require the loss of 6 legal parking spaces and about 6 illegal spaces.

The above three projects will result in a loss of 30 parking spaces. In addition there are many locations where cars park in locations that are legally restricted areas, such as curb spaces adjacent to crosswalks at intersections.

OTHER TERMINAL FACILITIES

Bus Terminal

Anaconda is served by one major interstate bus company, Intermountain Transportation Bus Lines. The terminal area is located at Seven Main Street with parking available on Main Street, in front of the terminal and to the rear of the terminal area. It appears the facility is adequate for the present time, but expansion possibilities appear limited.

There are ten scheduled arrivals and departures daily, serving the

major cities in Montana. Intermountain Bus Lines provides three scheduled round trips out of Butte to Idaho Falls, Idaho daily. This bus line also serves as a connecting carrier to Grayhound Bus Lines with some transporting of freight and mail.

The terminal is well located with respect to the major population centers of the city.

Motor Freight

Olof Billquist City Transfer and Storage Company, located on Commercial Avenue near the downtown area, provides motor freight service.

John Ruginski, located on Birch Street, also provides motor freight service for Anaconda. These companies serve local needs as well as motor freight needs within a 25 mile area. Olof Billquist serves as a connecting carrier with the Mayflower Truck Lines.

Railroads

Anaconda is served by the Butte, Anaconda and Pacific Railroad. Only freight service is provided, with freight exchange made with Union Pacific and Burlington Northern Railroads in Butte.

The freight office is located east of Anaconda in the smelter complex area. There appears to be no problem in expanding the terminal operation should future rail freight needs increase.

Location of the various terminal and transfer facilities mentioned in this portion of the chapter are shown in Figure II-12.

TERMINAL & TRANSFER FACILITIES

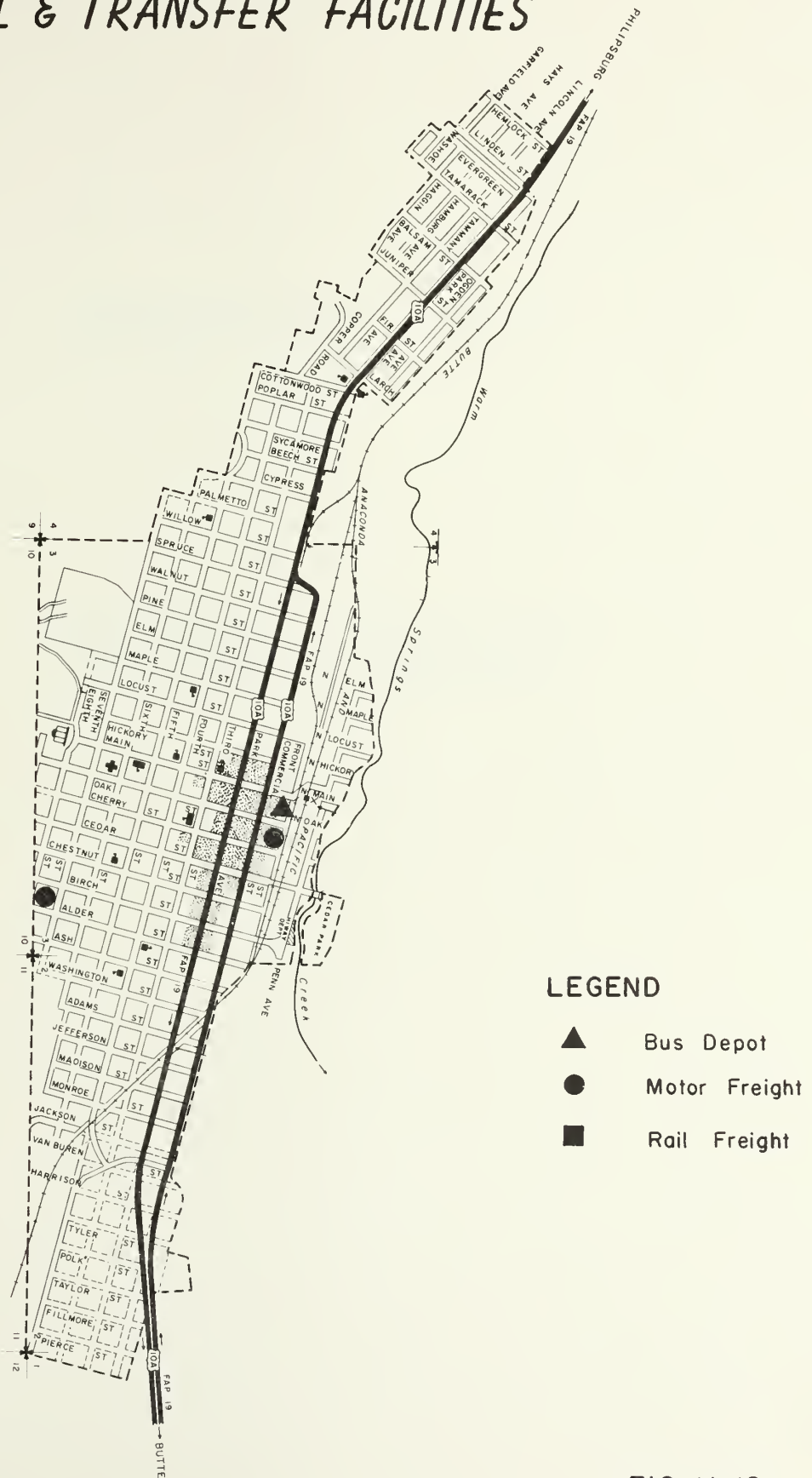


FIG. 11-12

CHAPTER III

TRAVEL STUDIES

Chapter III

T R A V E L S T U D I E S

EXTERNAL ORIGIN-DESTINATION SURVEY

The determination of the travel desires of motorists using the existing highways and streets in an area is a basic element to the development of new or improved highway facilities. An external origin and destination survey was undertaken in Anaconda in June, 1973 as a result of Anaconda citizens's expressed desires to remove truck traffic from the central business district. This survey provided data on travel patterns and, in conjunction with the surveillance of existing traffic conditions already discussed, served as a major aid in determining the feasibility of a truck bypass and in planning a future highway and arterial street improvements. In brief, an origin and destination survey is a study of the origins and destinations of trips passing out of, into, or through a selected area.

Roadside Interviews

External origin and destination data was collected by interviewing a large proportion of all outbound motorists at two external stations located near the urban area boundary on U.S. 10A, one to the east and the other to the west. Interviews were obtained between 6:00 a.m. and 9:00 p.m. at each of the two stations over a four day period. These interviews were later expanded to obtain a total twenty-four hour average daily traffic volume representing an average total day of travel for

each station. Figure III-1 represents the division of the study area into districts and the interview station locations.

Travel Patterns

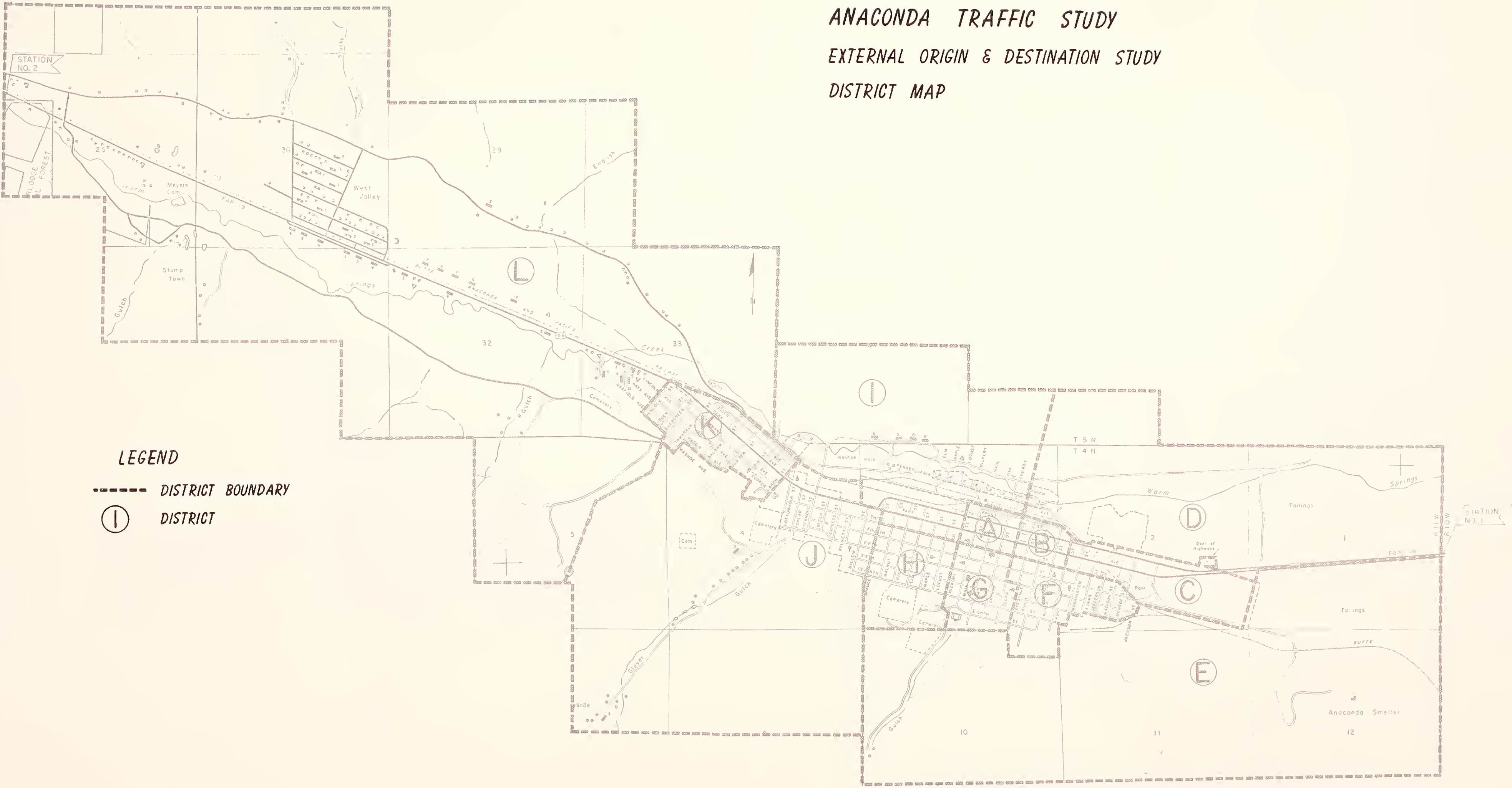
Existing travel desires for the Anaconda Urban Area are expressed in illustrations that follow as desire lines of travel. These desire lines are drawn without regard to the existing street system in order to more clearly indicate major travel corridors on the basis of motorists' travel desires, rather than the actual travel paths on existing street facilities. As mentioned above the study area was divided into districts for illustrative purposes to show the points of motorists' trip origins and destinations.

Present travel patterns of traffic intercepted at the survey stations are summarized in Tables III-1 ,III-2 , III-3 ,III-4 , and depicted in Figures III-2 , III- 3, III-4 , and III-5 .

Table III-1 summarizes traffic for the study area stratified by TOTAL TRAFFIC and by TRUCK TRAFFIC.

Figure III-2 illustrates traffic desire lines of all traffic entering and leaving Anaconda on U.S. 10A East during an average week-day in June, 1973 and is summarized in Table III-2 .

ANACONDA TRAFFIC STUDY
EXTERNAL ORIGIN & DESTINATION STUDY
DISTRICT MAP



TABULATION OF TRAFFIC, TWO EXTERNAL STATIONS

Table III - 1

<u>Station Location</u>	<u>Number of Interviews</u>	<u>Total Internal External Traffic</u>	<u>Total Through Traffic</u>	<u>Total Average Weekday Traffic</u>	<u>Truck Internal External Traffic</u>	<u>Truck Through Traffic</u>	<u>Truck Average Week Day Traffic</u>	<u>Truck Traffic As % of Total Traffic</u>
1-US 10A	2,264	6,477	451	6,928	348	22	370	5.3
2-US 10A	856	1,692	451	2,143	168	22	190	8.9

STATION NO. 1 EAST



DISTRIBUTION OF ALL TRAFFIC

STATION 1-US 10A EAST

Table III-2

All Internal-External Traffic This Station-----	6477
All Through Traffic This Station-----	451
All Internal-External & Through Traffic This Station-----	6928
Percent of Traffic This Station To The Central Business District--	20.1
Percent Through Traffic of Total-----	6.5

Figure III-3 illustrates traffic desire lines of all traffic entering and leaving Anaconda on U.S. 10A West during an average weekday in June, 1973 and is summarized in Table III-3.

DISTRIBUTION OF ALL TRAFFIC

STATION 2-US 10A WEST

Table III-3

All Internal-External Traffic This Station-----	1692
All Through Traffic This Station-----	451
All Internal-External & Through Traffic This Station-----	2143
Percent of Traffic This Station to the Central Business District--	19.8
Percent Through Traffic of Total-----	21.0

Figures III-4 and III-5 illustrates traffic desire lines of truck traffic entering and leaving Anaconda on US 10A East and US 10A West during an average weekday in June, 1973 and is summarized in Table III-4

ANACONDA TRAFFIC STUDY
EXTERNAL ORIGIN & DESTINATION STUDY
DISTRIBUTION OF ALL TRAFFIC
STATION NO. 2 WEST

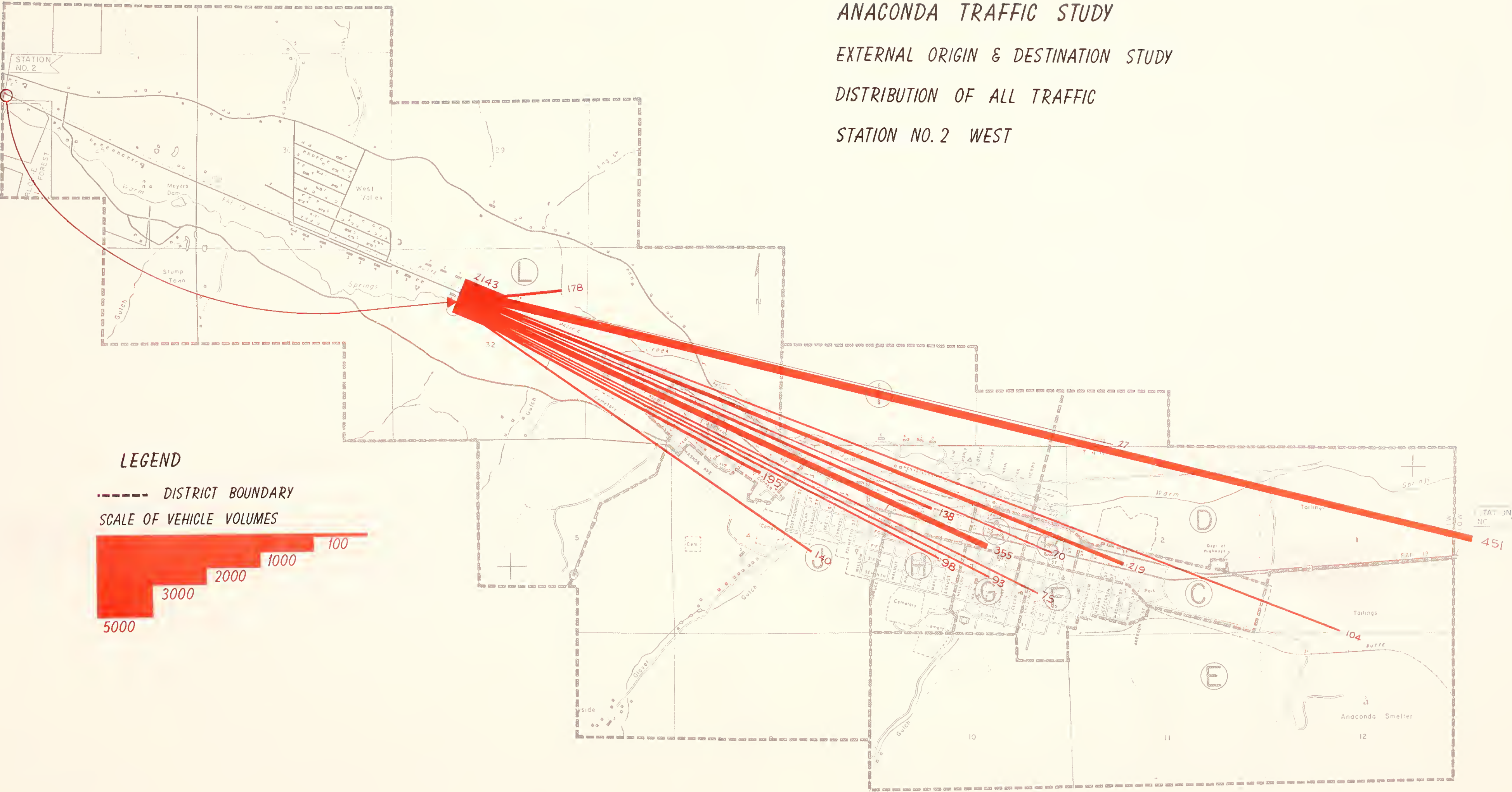


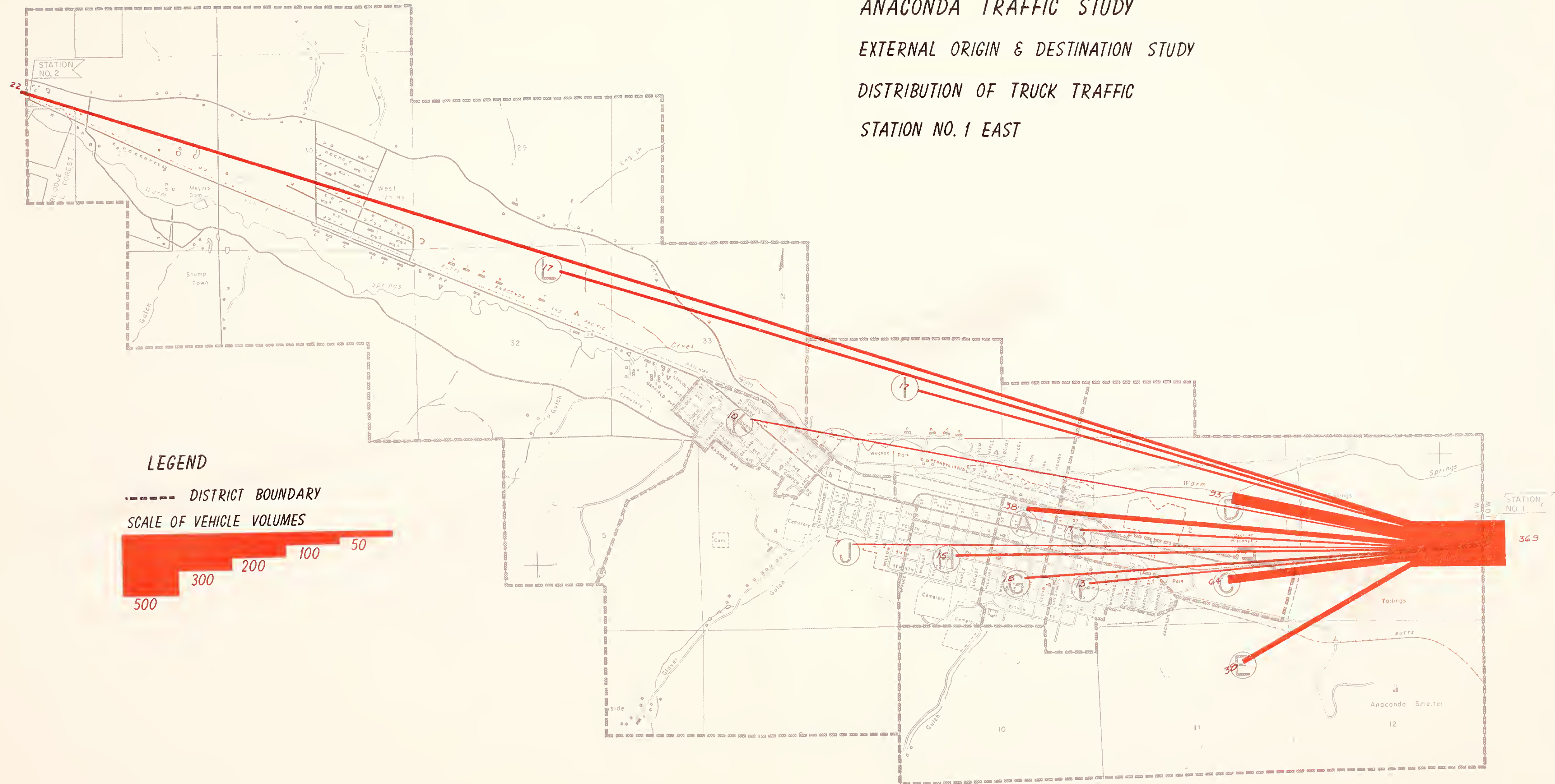
FIG. III-3

ANACONDA TRAFFIC STUDY

EXTERNAL ORIGIN & DESTINATION STUDY

DISTRIBUTION OF TRUCK TRAFFIC

STATION NO. 1 EAST

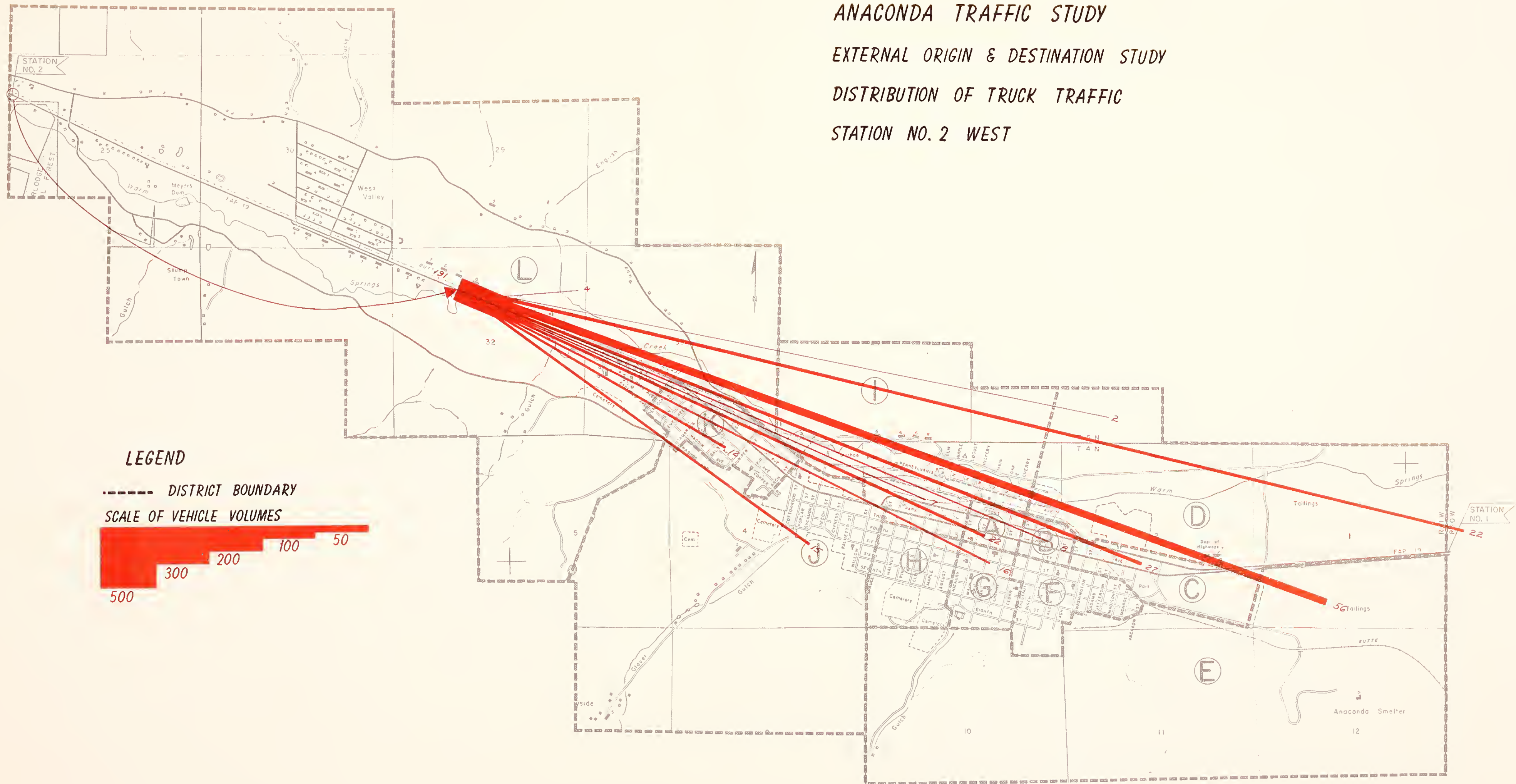


ANACONDA TRAFFIC STUDY

EXTERNAL ORIGIN & DESTINATION STUDY

DISTRIBUTION OF TRUCK TRAFFIC

STATION NO. 2 WEST



ANACONDA ORIGIN AND DESTINATION SURVEY

DISTRIBUTION OF TRUCK TRAFFIC

JUNE, 1973

Table III- 4

<u>District of Last Stop</u>	<u>Truck Traffic</u>	
	<u>External Station West of Anaconda</u>	<u>External Station East of Anaconda</u>
A	22	38
B	8	17
C	27	64
D	2	93
E	56	38
F	0	13
G	16	18
H	0	15
I	7	17
J	15	7
K	12	10
L	4	17
Through Traffic	<u>22</u>	<u>22</u>
TOTAL	191	369

Anaconda is situated in a narrow valley which lies in an east-west direction. The east-west highway (U.S. 10A) carries the heaviest volume of traffic. Speed and delay runs were made along this route. Several trips were made by a vehicle which traveled at the speed limit or floated with surrounding traffic. Observations were made of elapsed time to various control points such as intersections and the length and occurrence of delays and stops. The elapsed time between points "A" and "B" varied from 6.93 to 8.76 minutes west bound and 7.66 to 7.82 minutes for east bound traffic. Time was generally faster for the west bound traffic because of the delay caused by the three traffic signals and more congested conditions of Park Avenue versus Commercial Street which carries the west bound traffic. The speed varied between 13.7 to 32.1 MPH over the course of these speed and delay runs. Figure III-6 shows the variation of overall travel speed for both east and west bound traffic traversing the length of the city.

ANACONDA TRAFFIC STUDY

1973 TRAVEL SPEEDS

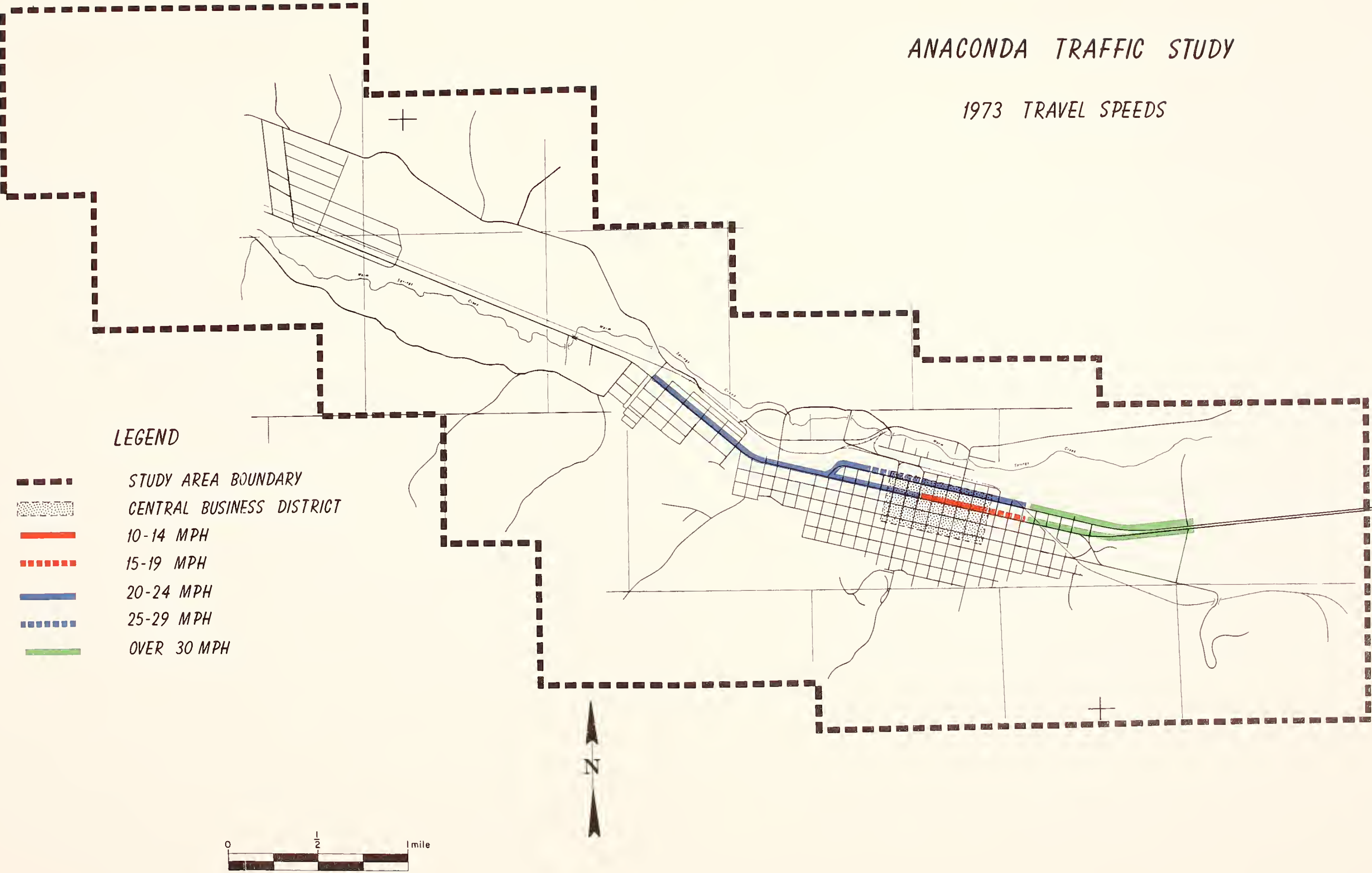


FIG. III-6

CHAPTER IV

RECOMMENDED IMPROVEMENTS

Chapter IV

R E C O M M E N D E D I M P R O V E M E N T S

RECOMMENDED STREET NETWORK

The 1990 Functionally Classified Street Network for the Anaconda Urban Area is illustrated in Figure IV-1. The principal arterial, Park Avenue and Commercial Street, serves the largest volume of traffic in the urban area. The minor arterial streets, Fourth Street and the proposed Northside Bypass route, are parallel to Park and Commercial and will supplement this principal arterial. The Northside Bypass route will serve most through traffic and trucks. Fourth Street does now and will continue to carry a considerable share of the traffic to the smelter in addition to general east-west traffic. The remaining streets of the system are collector streets serving to move traffic to and from the arterials in a north-south direction.

The proposed improvements of the street system are illustrated in Figure IV-2. These improvements are the work to be done within the next twenty years. The proposed projects are listed in Table IV-1 in priority array with estimated cost, description of work, FAP system classification and recommended priorities.

ANACONDA TRAFFIC STUDY

1990 FUNCTIONAL CLASSIFICATION

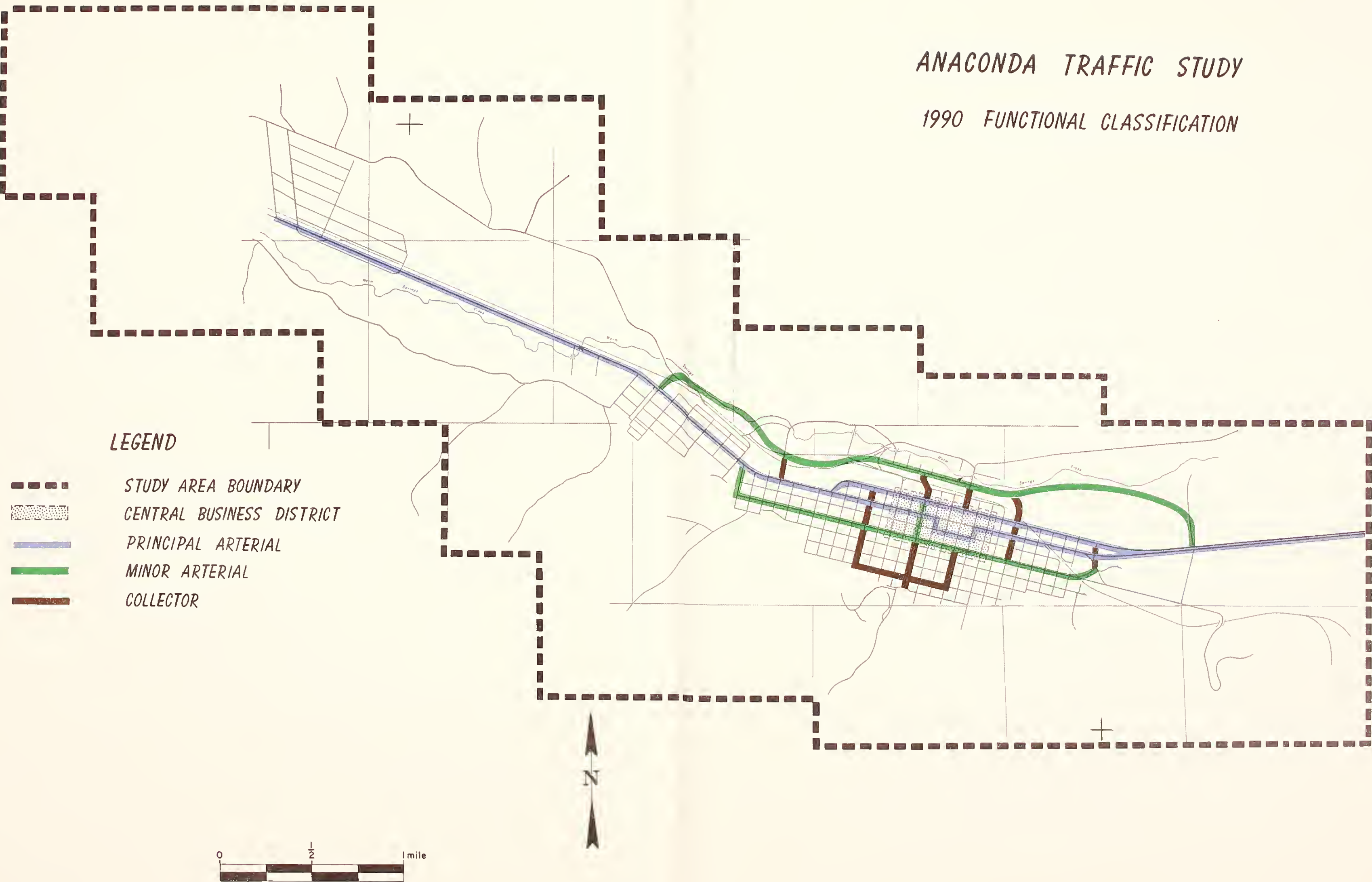


FIG. IV-1

ANACONDA TRAFFIC STUDY
1990 RECOMMENDED SYSTEM
PROPOSED STREET IMPROVEMENT

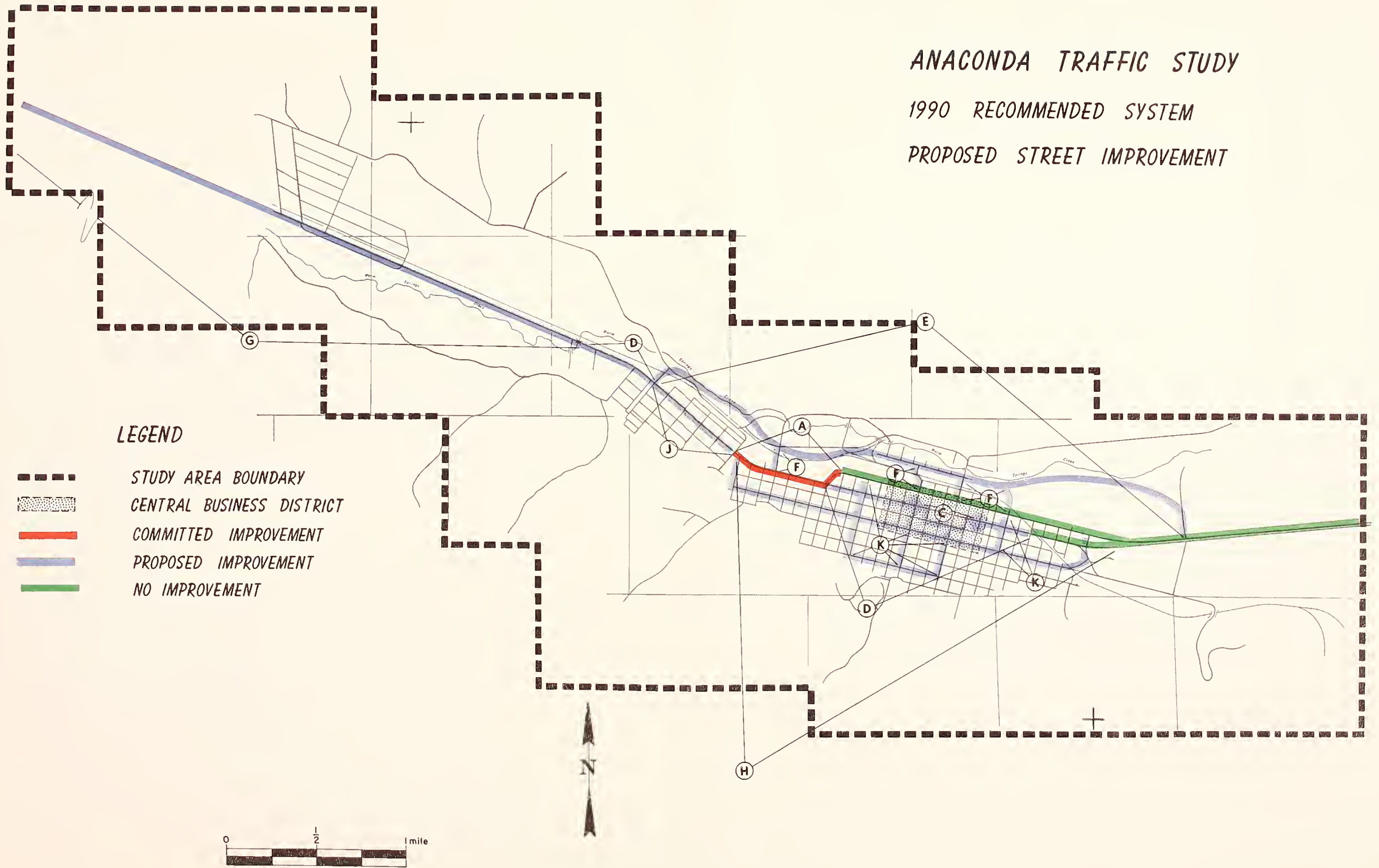


FIG. IV-2

Table IV-1

RECOMMENDED HIGHWAY IMPROVEMENT

Priority Array	Location	Improvement	Federal Aid System	Estimated Cost
1	A Park Avenue Larch to Spruce	Widen to four lanes	Urban Extension	610,000
2	D Park Avenue	Improve reroute around Mall plus transition to West Valley Highway	Urban Extension	258,000*
4	E Northside Bypass	Grade, drain, pave, and bridges-two lane highway	Urban	1,904,700
5	F Sycamore, Main Cedar and Ash Commercial to Bypass Route	Expand streets across R.R. to bypass route and reconstruct	Urban	260,000
2	B School Signing	Provide traffic control devices for Byron, Washington Lincoln, St. Paul Elementary plus Junior and Senior High	Urban	6,400
2	C Intersection Improvements Park Ave. W/ Main and Birch	Curb and Gutter, Traffic Signals, Markings and Signs	Urban Extension	22,450
3	G West Valley Highway 4 miles west of city	Widen, frontage road and bike path	Rural Primary	1,095,000

* See Table V-1

Table IV-1

RECOMMENDED HIGHWAY IMPROVEMENT (cont.)

Priority Array	Location	Improvement	Federal Aid System	Estimated Cost
7	H Fourth Street	Reconstruct - 21 blocks	Urban	735,000
6	J Park Avenue Evergreen to Larch	Reconstruction - curbs 8 gutter, storm sewer	Urban Extension	490,000
8	K Elm, Main, Cedar, Ash & Seventh Streets	Reconstruct streets - 28 blocks	Urban	980,000
9	L Park Avenue	Reconstruct Street Spruce to Oak and Chestnut to Adam 12-blocks	Urban Extension	518,000
		TOTAL		6,935,150

* See Table V-1

TRUCK BY-PASS

Introduction

The Deer Lodge Comprehensive Plan recommends a truck bypass around the City of Anaconda. It recommended a route from U.S. 10A near the west city limits to the area north of the B.A. & P. Railroad tracks. Trucks now hauling lime rock and logs from areas west of Anaconda to the Anaconda Co. Smelter and other points must pass through the central business district thus creating a safety hazard to pedestrians and congestion to local traffic in the downtown area. A downtown development plan is being formulated which would require the closing of Park Avenue and the routing of traffic around a proposed downtown mall. It would be difficult for heavy trucks to make this maneuver. The community's desire to remove through trucks from passing through the central business district has been stated in the objectives of Deer Lodge County Plan and the unified downtown mall in the central business district.

The following alternatives solutions were investigated:

- (1) The route outlined in the Comprehensive Plan;
- (2) A route generally north of the B.A. & P. Railroad and south of Warm Springs Creek, labeled, "A";
- (3) A route generally north of Washoe Park and Warm Springs Creek labeled, "B";
- (4) A route around the South side of Anaconda.

Alternatives 1,2, and 3 are illustrated in Figure IV-3.

The horizontal alignment of the Comprehensive Plan route would seriously restrict vehicular speed. It would require crossing the B.A. & P. Railroad tracks at four locations. It follows existing roads on the west and north side of Washoe Park which are included in the boundaries of that park; therefore, this route would require a 4F clearance.

ANACONDA TRAFFIC STUDY

ALTERNATE TRUCK ROUTES

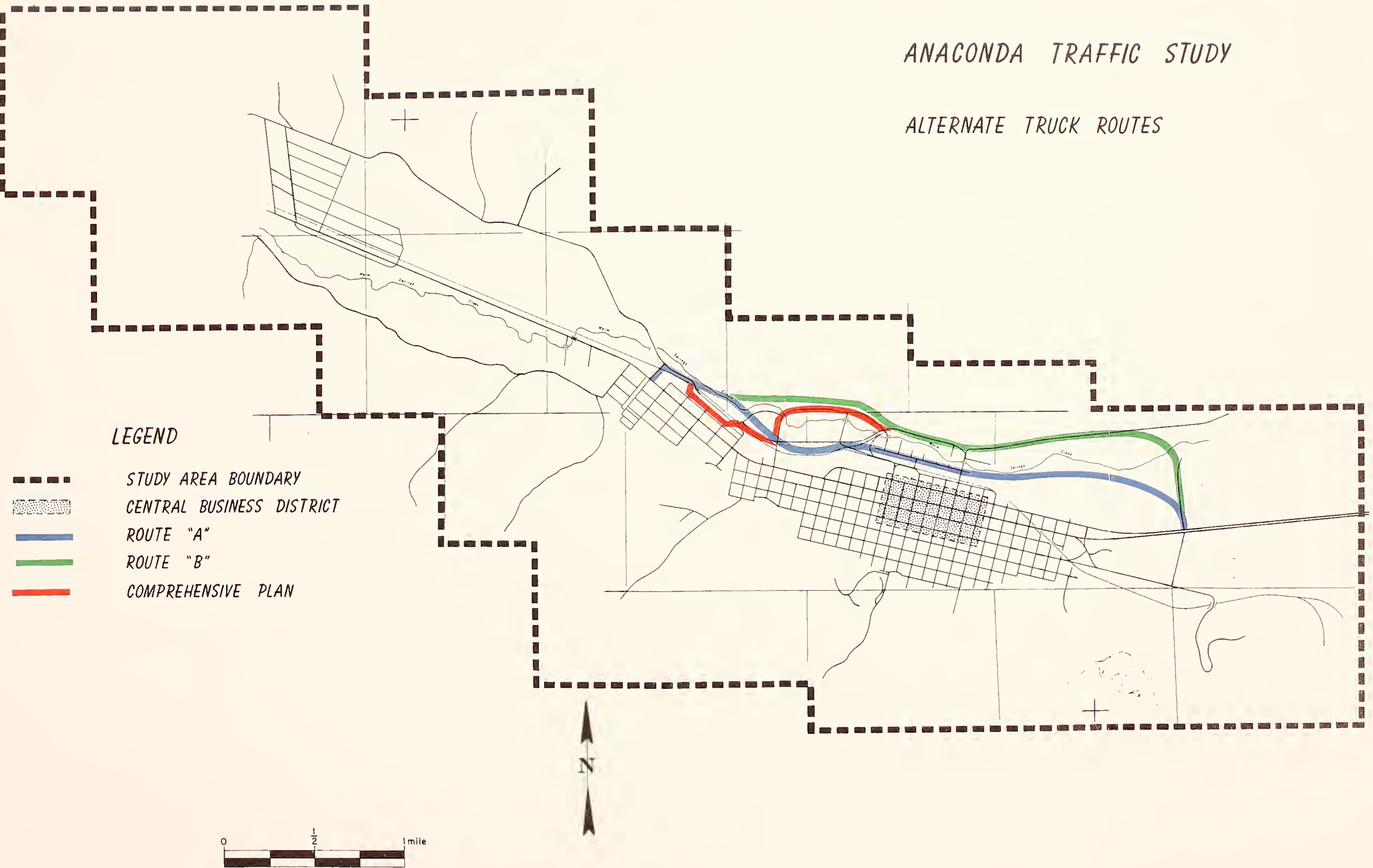


FIG. IV-3

Route "B" is a modification of the Comprehensive Plan; however, it's alignment is such that it will not restrict speed and it will be outside the Washoe Park thus eliminating the 4F problem.

Route "A" is located north of the B. A. & P. Railroad but is south of Washoe Park. It would serve the area now zoned industrial. In order to avoid encroaching onto the Park, it will be necessary to acquire the north portion of the railroad yard. Because of the location of Route "A" close to the railroad and within the industrial zone, it will serve a greater volume of traffic, in particular, truck traffic.

A route around the south side of Anaconda was considered but not felt worthy of detailed analysis because of its longer length and steep terrain on the south side of Anaconda. In addition, the location of the Anaconda Smelter at the east end of the route would prevent the bypass from rejoining U.S. 10A on the east side of Anaconda.

Total Traffic Volumes

The external origin and destination study conducted in June 1973 furnished data in which traffic volumes could be estimated for the alternate bypass routes. The O and D study procedures and results were discussed in Chapter III. Traffic volumes assigned to routes "A" & "B" taken from this O & D survey are listed in Table IV-2. Districts and survey stations are illustrated in Figure III-1.

Assuming an expansion factor of 2.00 for projecting external-internal and internal-external traffic to 1995 for the Routes "A" and "B", the 1995 traffic volume would be 2710 v.p.d. for the Route "A" and 2240 v.p.d. for the Route "B". In addition, it can be assumed that a certain volume of internal to internal trips would be served by either bypass route. Assuming 50% of the bypass traffic could be added to

TABLE IV- 2

<u>Survey Station #1</u>	<u>Original Route "A"</u> <u>Vehicles Per Day</u>	<u>Alternate Route "B"</u>
District L	329	329
District K 1/3 x 363	121	---
District D 1/3 x 212	70	53
District 1	<u>127</u>	<u>127</u>
	647	509
 <u>Survey Station #2</u>		
Thru Traffic	451	451
District E	104	104
District C 1/3 x 219	73	---
District D	27	27
District B 1/2 x 70	23	---
District 1	<u>30</u>	<u>30</u>
	708	612
Total Traffic	1,355	1,121

account for internal trips for Route "A" and 25% could be added for Route "B", the 1995 total trips are estimated to be 4050 v.p.d. for the Route "A" and 2800 v.p.d. for the Route "B".

Truck Volumes

The origin and destination study indicated a total of 285 trucks could use a truck bypass for all or for a portion of their trips. Table IV- 3 indicates the origin and destination of these truck trips in and out and around the City of Anaconda. If the same expansion factor was used to expand this truck traffic for 1995 the expected volume of the truck trips that could be assigned to the truck bypass routes would be 570 trucks per day. The City of Anaconda by ordinance, proper signing, and enforcement can require approximately the same number of trucks to use either truck bypass route.

TABLE IV-3
ANACONDA ORIGIN AND DESTINATION SURVEY
DISTRIBUTION OF TRUCK TRAFFIC
June, 1973

<u>District of Last Stop</u>	<u>External Station West of Anaconda</u>		<u>External Station East of Anaconda</u>	
	<u>To Bypass</u>	<u>To Existing Streets</u>	<u>To Bypass</u>	<u>To Existing Streets</u>
A	22		38	
B	8			17
C	37			64
D	2			93
E	56			38
F				13
G		16		18
H				15
I	7		17	
J		15	7	
K		12	10	
L		4	17	
Sub Total	<u>122</u>	<u>47</u>	<u>89</u>	<u>258</u>
Ore Total Trips-52				
Through Truck-22				
Total Trucks Assigned To Bypass Route	122 + 89 + 52 + 22 = 285			

Design Criteria

The typical section proposed for both Routes "A" & "B" would be a 2-12 Ft. Traffic lanes with two ten ft. shoulder lanes of a 44 foot paved

width as illustrated in Figure IV-4. The design speed for this facility should be at least 40 m.p.h. Grade intersections would be provided at the western terminus with U.S. 10A at Evergreen Street and the eastern terminus of the bypass route where the city dump road intersects Highway U.S. 10A. For Route "A", at grade intersections could be provided for the north-south streets of Sycamore Street and Cedar Street. An approach to Washoe Park could also be provided. For Route "B" at-grade intersections would be provided at approximately Elm Street and Cedar Street. Route "B" could be constructed using a rural design section for its entire length. Route "A" could use a rural design section for the majority of its length; however, a curb and gutter section would have to be provided from approximately the entrance to Washoe Park easterly to Birch Street. Both alternate routes would require two crossings on Warm Springs Creek. These crossings should be bridge structures.

Illumination should be provided for both western and eastern terminus of the bypass route. In addition, the street intersections along this route should be provided with illumination.

Cost Estimate

The estimated construction cost of both alternates "A" & "B"

(44' wide section) is as follows:	<u>"A"</u>	<u>"B"</u>
Rural Section (250,000/mi.)	\$620,000	-----
Original Route 2.49 mi.		
alternate route 3.46 mi.	-----	\$865,000
Urban Section (\$4000,000 mi.)	\$360,000	-----
Original Route 0.90 mi.		
Bridges @\$50,000 each	\$100,000	\$100,000
Intersection Treatment with		
Park Street @West end	<u>\$12,000</u>	<u>\$12,000</u>
	\$1,092,000	\$977,000
 Preliminary engineering 7.5%	 \$81,000	 \$73,300
Construction engineering 10.0%	<u>\$109,200</u>	<u>\$97,700</u>
Construction Subtotal	\$1,283,100	\$1,148,000

PROPOSED TRUCK BYPASS TYPICAL SECTION

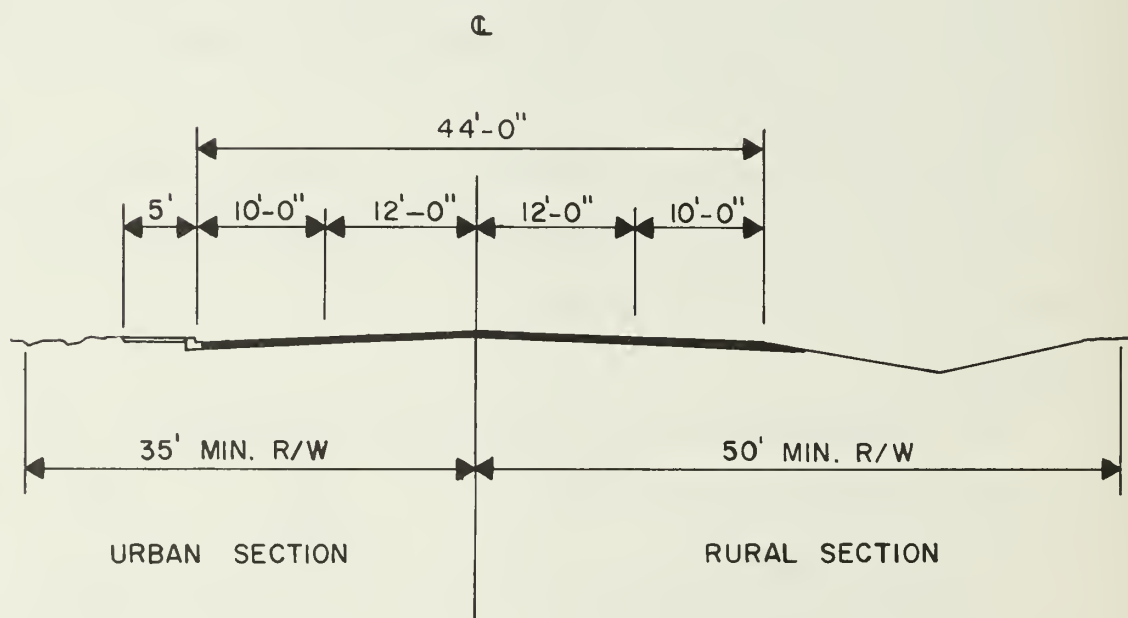


FIG. IV-4

	<u>"A"</u>	<u>"B"</u>
Right-of-way	245,000	124,600
Utility Adjustments	<u>376,600</u>	<u>49,200</u>
Grand Total	\$1,904,700	\$1,321,800

Comparison of Alternate Truck Routes

The following discussion of the two alternate truck bypass routes is made to aid the decision makers in their choice of the route to build.

Route A will cost forty-five percent more than Route B. The majority of difference in cost is due to the damages to the yard of the Butte, Anaconda and Pacific Railroad. However, Route A will serve forty-five percent more traffic than Route B, because of its closer proximity to the central business district. Route A will have more access points than Route B (9 versus 6) to allow traffic to enter and exit from the bypass.

Economic evaluations of each route and a comparison of each route to the existing route through the CBD were made.

Route B was 27% cheaper than Route A when compared on the equivalent uniform annual economic cost method. In this method of comparison all alternatives are compared on the basis of their equivalent uniform annual cost.

When compared to the existing route each route showed a rate of return of 7%. Route A will give this rate of return in 9+ years. Route B will give this return in 5 years. In this method of comparison each alternate is compared to the existing route. The savings in annual road user costs are divided by the difference in investment costs.

Both routes showed a favorable cost benefit ratio when compared to the existing route. Route A showed cost-benefit ratio of 1.79, while Route B showed a cost-benefit ratio of 2.62.

Detailed estimates of the cost of right-of-way and utility adjustments, particularly the cost of damages to the B.A. & P. Railroad, should be made to determine if the ratio of costs remains the same as originally

estimated. If funds are available and the cost remains as originally estimated, Route "A" should be built in preference to Route "B" because of its greater service, less noise pollution and less impact on the visual environment.

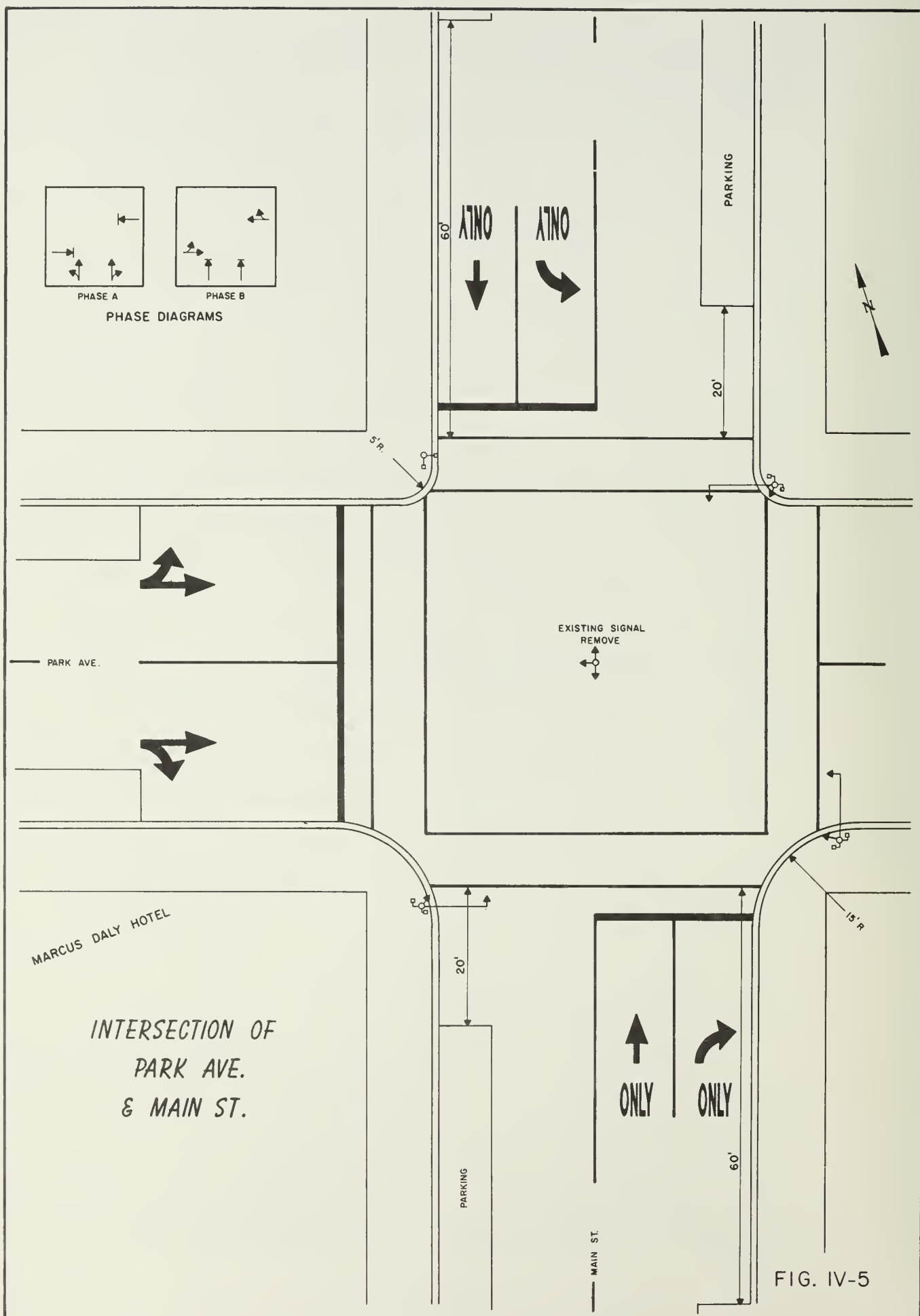
TRAFFIC OPERATIONS PROJECTS

Traffic Signals

The consulting firm of Clete Daily and Associates inventoried all traffic control devices in Anaconda in 1972. At that time, there were eight traffic signals and four red flashing beacons to control traffic for fire engine emergency runs. All of the traffic signals were two phase, pretimed with one indication for each approach. None of the installations had WALK-DONT-WALK pedestrian indications. The signal at the intersection of Park Avenue and Main Street was reported damaged by fire in 1972; however, it has been replaced since that fire. Turning counts have been made at the signalized intersections of Park Avenue. These counts indicate that only the intersection at Main Street will meet the minimum warrants to justify a traffic signal. A modern design signal should be installed at this intersection to comply with the Manual on Uniform Traffic Control Devices. The installation would require as a minimum two vehicular signal faces per approach plus WALK-DONT-WALK indication for each crosswalk. Parking on the east side of Main Street should be converted from angle to parallel. A left-turn lane for the north leg and a right-turn lane for the south leg should be provided. Figure IV-5 illustrates the improvements proposed for this intersection. The cost of this project is estimated to be \$19,000.

The traffic signal at the intersection of Park and Cherry will be removed when the proposed Mall is constructed.

A review of the accident history at the intersection of Park Avenue and Birch Street reveals that of the 26 accidents occurring for the years 1968 through the first half of 1973, 13 were rear-end type and 10 involved collisions with vehicles deparking from angle parking positions. It is proposed to remove the existing sub-standard signal which should



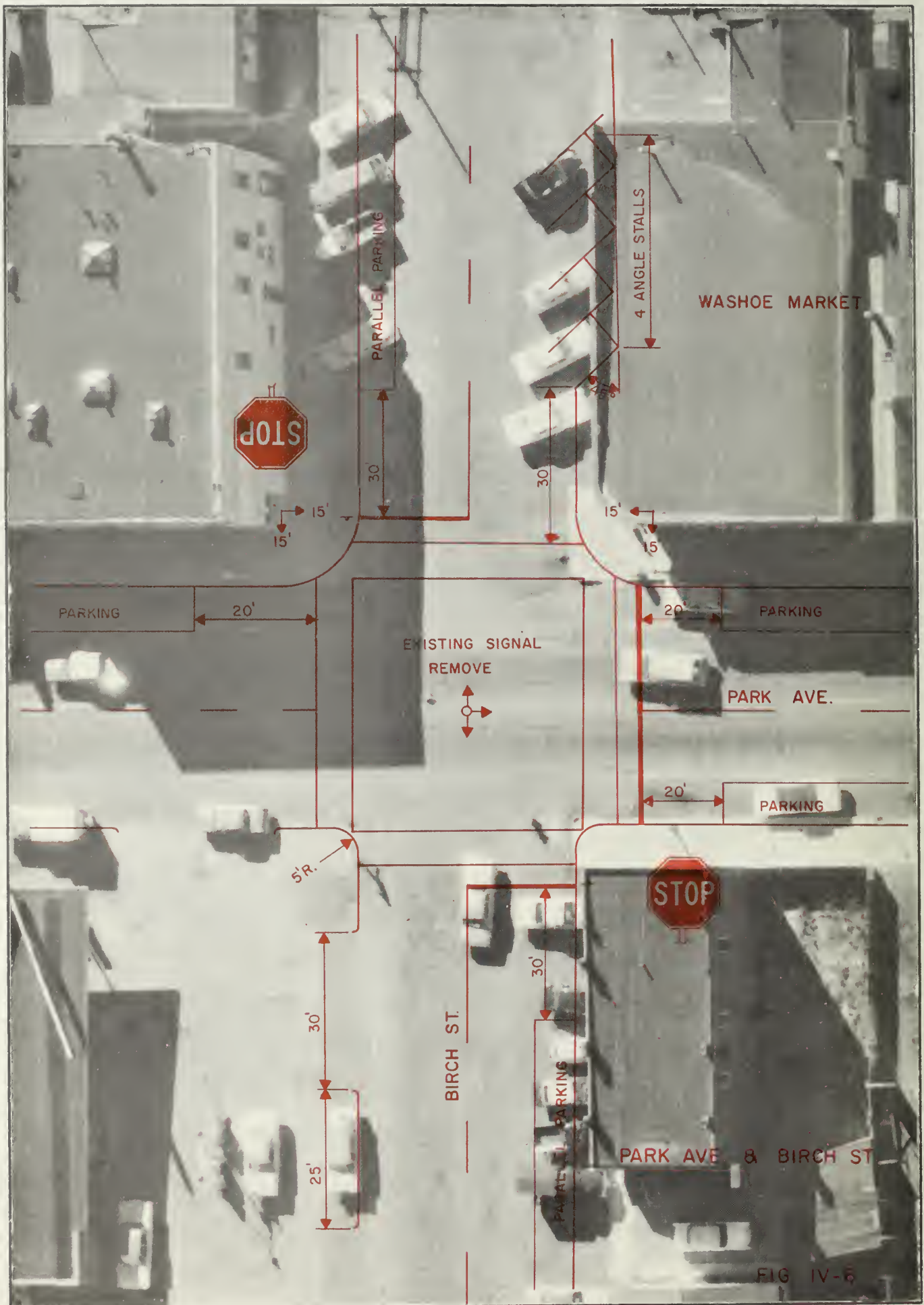
reduce the occurrence of rear-end type accident and the delay experienced by both vehicles and pedestrians. In addition, parallel parking should be substituted for angle parking which will reduce the number of accidents involving deparking vehicles. If proper parking procedures are adopted and practiced, improved visibility between vehicles and pedestrians would result. Figure IV-6 illustrates the improvement of this intersection. The estimated cost of this project is \$3000 for 300 linear feet of new curb and gutter plus \$450 for new stop signs, pavement marking and removal of existing signal.

Signing

The functionally classified and approved network for Anaconda Urban Area is shown in Figure II-1. The principal arterial system, including Park Avenue and Commercial St., serve as connecting links to the rural arterial system. These two streets are presently signed in accordance with the Manual on Uniform Traffic Control Devices. The remaining streets on the system need to be signed with regulatory and warning signs. The cost of installing stop signs with street name signs is estimated to be \$37.25 per sign. It will take approximately 100 stop signs to properly sign these streets; therefore the cost of installing these signs would be \$3700 plus \$1300 for engineering or a total of \$5000 for the project if the city does the work.

Signing And Pavement Marking For Schools

Traffic control devices for the six elementary, a junior and a senior high schools are either inadequate or non-existent. All of the school signs inventoried by Clete Daily and Associates were judged inadequate because they were obsolete. Each school should have an engineering and traffic investigation conducted to determine the proper signs and markings



at their location.

A limited investigation was conducted at the Bryon School. The traffic volume on Fourth Avenue is such that there will always be on the average at least one safe gap per minute during the time school children are crossing. The number of children crossing Fourth Avenue at Washington should be surveyed. If there are at least 50 children crossing during two periods of a school day, a bouncing-ball amber, flashing beacon can be installed over and under the school crossing sign (S2-1). The traffic volume on Fourth will not justify continued use of a traffic signal; therefore it should be removed. The improvement of school signing and pavement marking is illustrated in Figure IV-7. The cost of this work would be \$700 if the city forces do the work. If the bouncing-ball amber flashing beacons are warranted and installed by city forces the additional cost would be approximately \$1200.

The Junior and Senior High Schools are located on Main Street, a collector street which serves the Court House and Hospital as well as these schools. It is proposed to remove the traffic signal at Main Street and Fourth Avenue because the present volumes do not warrant this signal. If further investigation shows that the minimum warrants for a four-way stop are met this control should be installed. This means of control provides safe operation for pedestrians and vehicles, in particular those making left turns. Figure IV-8 illustrates the proposed improvements and estimated cost.

The school crosswalks between Dwyer and Westside Elementary Schools should be investigated to determine if the frequency of safe gaps for school age pedestrians is such that a traffic signal is justified. This traffic investigation can be done by Department of Highways personnel and

BRYON SCHOOL IMPROVEMENT

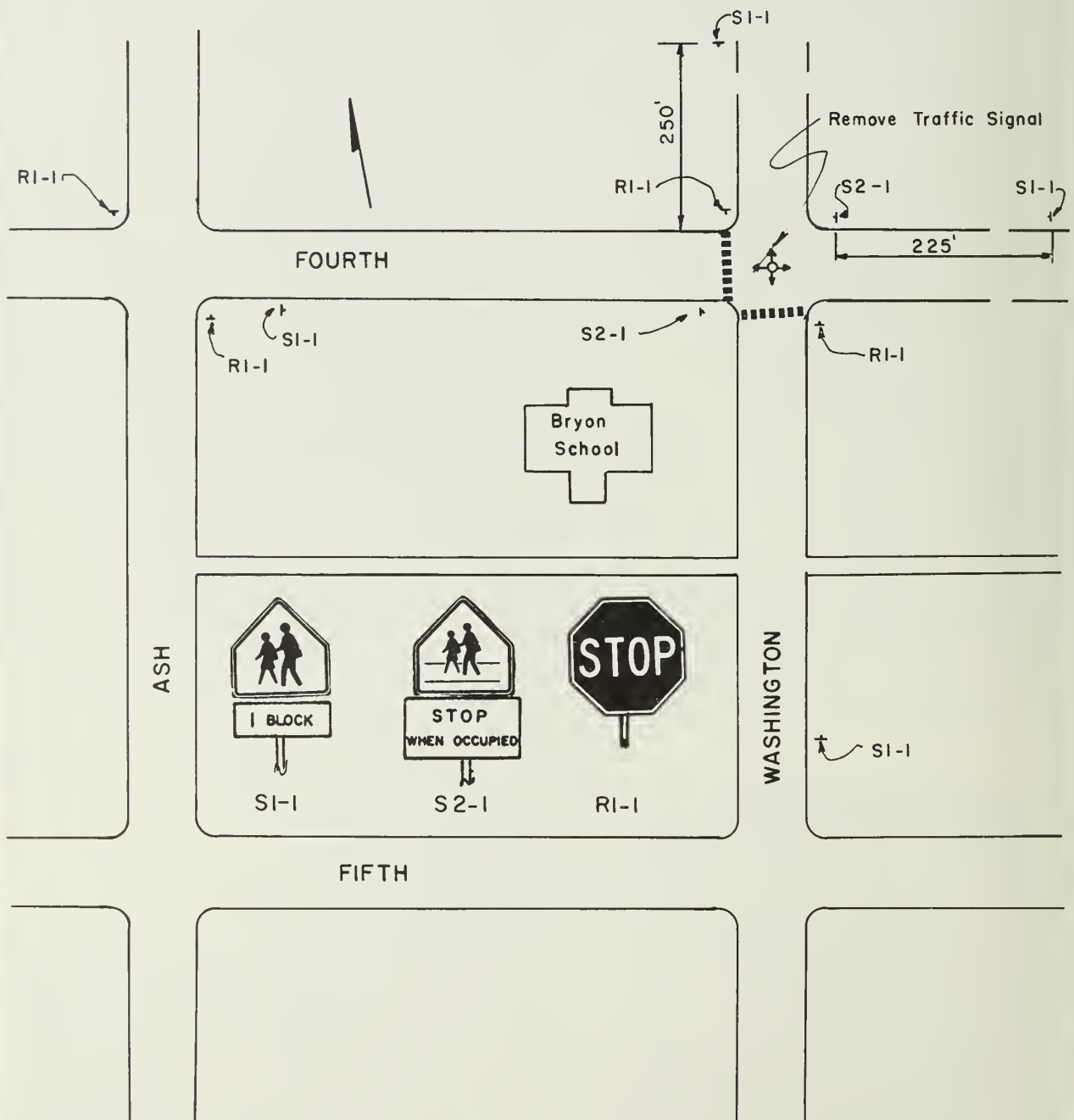


FIG. IV-7

JR. & SR. HIGH IMPROVEMENTS

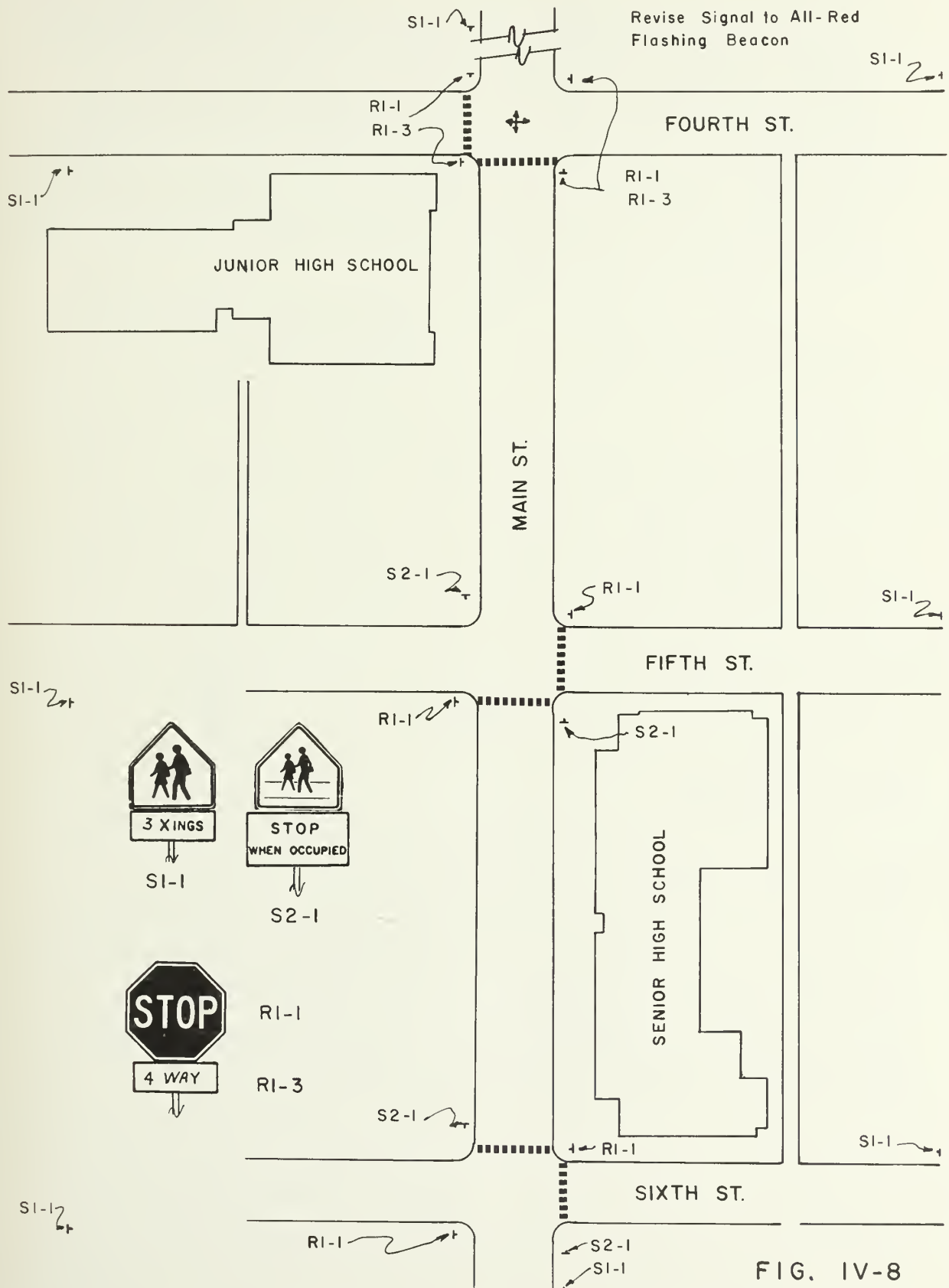


FIG. IV-8

the proper devices would be installed as part of the project to widen Park Avenue.

Providing proper traffic control devices for the eight schools in Anaconda, although relatively inexpensive, is vital for safety of school age pedestrians. Even when the crosswalks and other devices are installed, it is even more important to teach children good safety pedestrian habits. This education is a continuing task and should involve parents, teachers, and the community.

The cost of the traffic control devices for the schools not on the state primary system would be as shown in Table IV-4 .

TABLE IV-4

1 & 2.	Junior and Senior High Schools	\$1400
3.	Bryon School	700
4.	Lincoln School	1200
5.	St. Pauls	700
6.	Washington	<u>900</u>
	Subtotal	\$4900
	Engineering	<u>1500</u>
		\$6400

Speed Limit Signing

Speed zone studies have been conducted to determine the need for speed zoning of sections of U.S. 10A through the study area. It is recommended that restudies be conducted on those sections of the highway where speed patterns are changing from rural to urban speeds. West Park Avenue and east Commercial Street are areas where the prevailing speed pattern is faster than the existing speed limit.

PARK AVENUE IMPROVEMENTS

Introduction

The major arterial highway through Anaconda (U.S. 10A) consists of the one-way couplet of Commercial and Park Avenue from the east city limits to a connection with the two-way, two lane Park Avenue west of Spruce. The two lane width section continues west to a junction with a four lane section west of Larch Street. The wide four lane section continues west until the west city limits. At this point, it meets the two lane West Valley Highway.

The Commercial Street part of the couplet section was constructed in 1961 and is adequate to handle the existing traffic load. The other street of the couplet, Park Avenue, has adequate width, however, the condition of the pavement, curb and gutter is deteriorated. A project to do this work was discussed at a combined corridor and design public hearing in September, 1972. This project has been delayed because the city of Anaconda is considering closing Park Avenue in the CBD area to provide a downtown Mall. A project to restore the physical condition of Park Avenue should be considered following a decision on the downtown Mall.

Mall Area

This Mall area would be between Oak and Chestnut Streets and Commercial and Third Streets. Seven street blocks within this six block area will be closed including a three block section of Park Avenue. The architect for the Mall recommended that east bound traffic be diverted to Third Street at Hickory and back to Park at Chestnut so that through traffic will be eliminated from the pedestrian areas within the Central Business District (CBD). Hickory Street would be made one-way south bound and all curb parking would be parallel. Double right turns would be permitted at the intersection of Park and Hickory and double left-turns would be

permitted at the intersection of Hickory and Third. Third Street would be made one-way east bound from Hickory to Chestnut. Figure IV-9 illustrates the traffic pattern that would implement this plan.

An alternate plan to provide a reroute of east bound through traffic would be to make the first right turn at Park Avenue and Oak Street, then left at Third and Oak. The first turn would be made from the stem of a "T" intersection. A driver would naturally reduce his speed approaching a visual obstruction across Park Avenue; therefore, he will be prepared for the first turn. The succeeding turns will follow close enough to each other that the driver will be anticipating them. The reroute would be two blocks shorter and would avoid diverting through traffic by the Commons, Post Office, Alpine Apartments and several residences.

The existing route for east bound traffic currently is a direct route through Anaconda. The closing of Park Avenue will complicate the driver's task regardless of which plan is implemented. The four right angle turns will require a reduction in speed below fifteen miles per hour to be negotiated safely. To aid the drivers expectance, an extensive highway sign system will be required. Overhead sign structures with guide signs and lane-use control signs will be required in advance of the intersections where route turns.

Figures IV-10, 11 and 12 illustrate the traffic pattern with signing and pavement markings for Alternate No. 2 of the reroute around the Mall. Overhead signs in advance of each of the four intersections will be required to provide directional guidance and regulatory lane use for each approach lane. Pavement marking arrows are used to supplement the lane use signs. Parking restrictions which are in accordance with Montana Motor Vehicle Code are illustrated. The signing, pavement

PARK AVE. REROUTE AROUND THE MALL



FIG. IV-9

INTERSECTION OF
PARK AVE.
AND OAK ST.

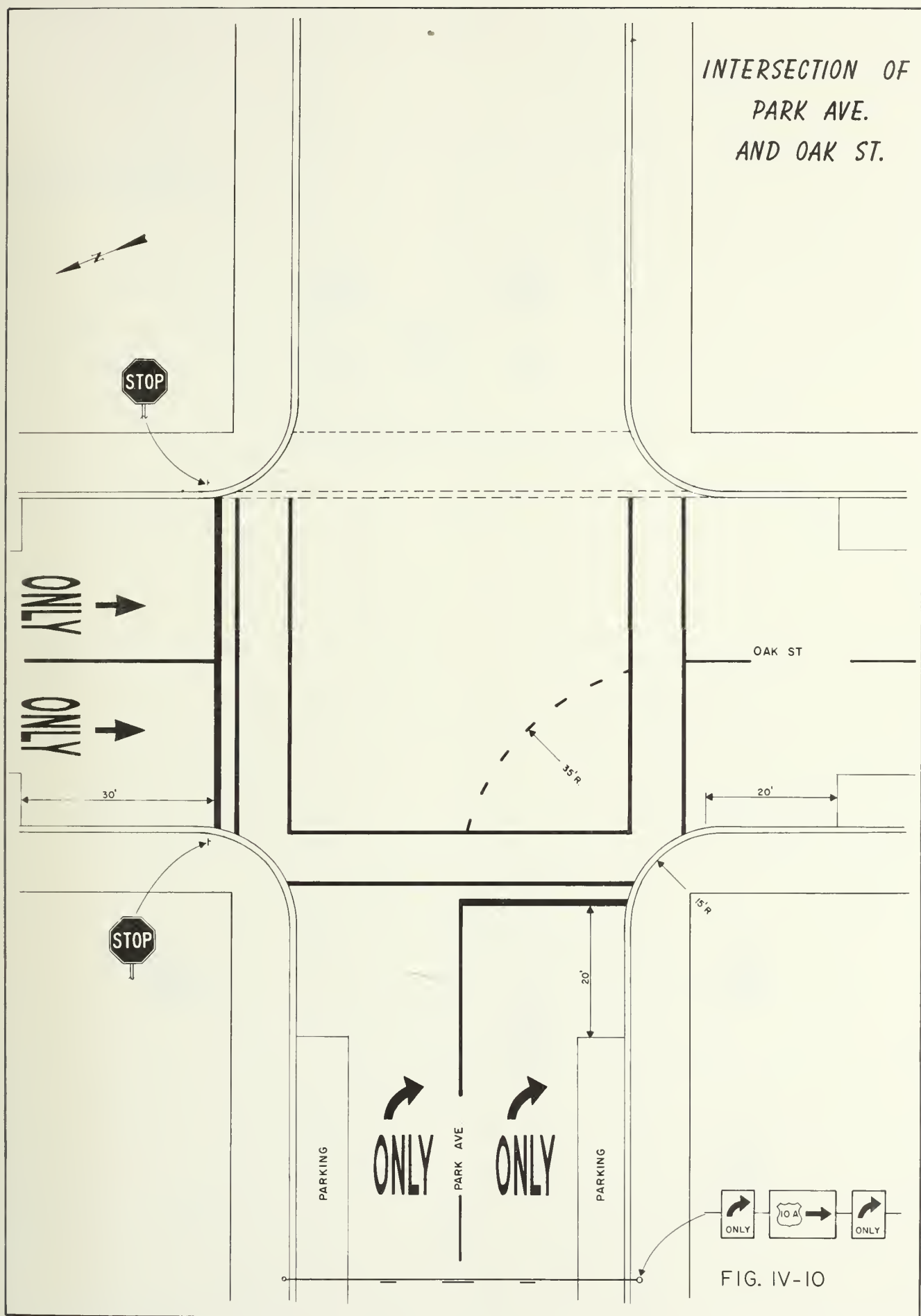


FIG. IV-10

INTERSECTION OF
THIRD AND
OAK STS.

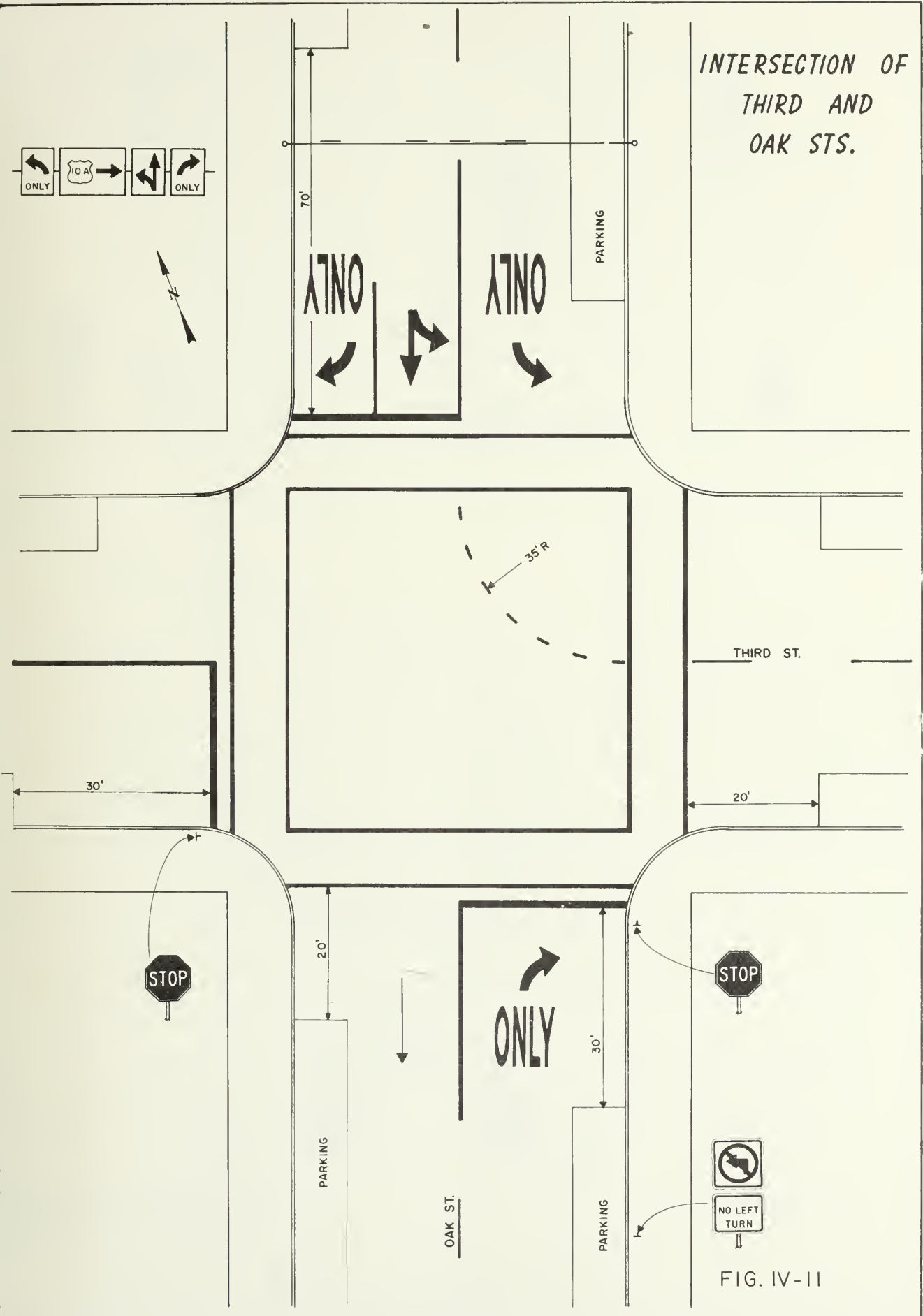


FIG. IV-II

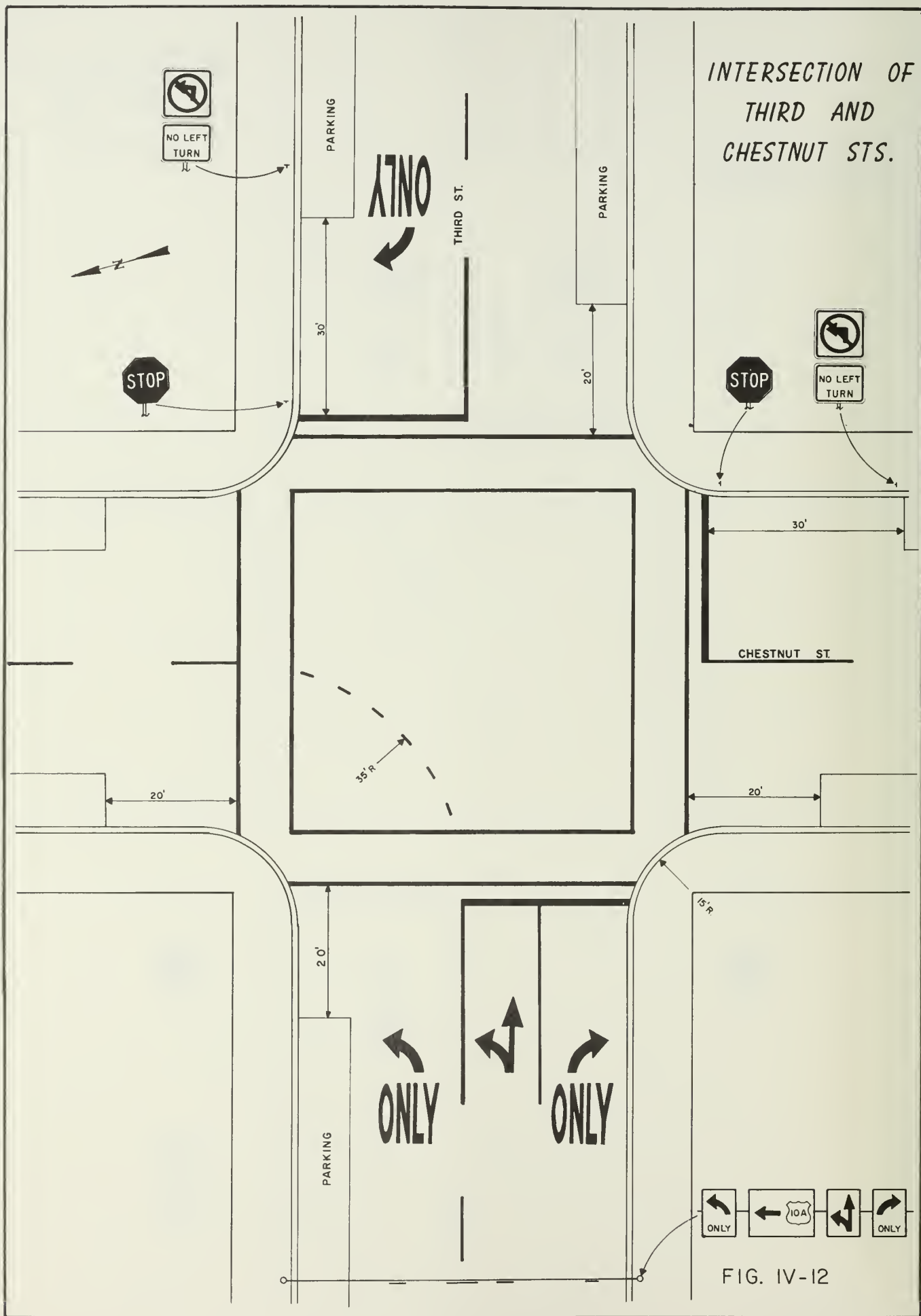


FIG. IV-12

markings and parking restrictions illustrated would be similar for alternate No. 2 of the Mall reroute.

Curb return radii of at least fifteen feet should be installed at all intersections where the route turns. All curb parking should be parallel along the curbs of all arterial streets. In addition, parking should be restricted at least twenty feet from crosswalks, but at those intersections controlled by stop signs or traffic signals, the parking should be restricted at least thirty feet from the crosswalks.

If alternate one is selected for the Park Avenue reroute around the Mall, the traffic signal at Park Avenue and Main may not be warranted. The proposed curb and gutter work and pavement markings should be done in either case.

Pavement Overlay

Park Avenue from Spruce Street easterly to the B.A. & P. Railroad needs to receive a pavement overlay; however, the street has been overlayed to the extent that it is felt that reconstruction is now necessary. If the Mall project is implemented, then the reroute of the east bound traffic around the Mall will require improving the affected roadway sections. The improvements to these sections should be of sufficient quality to support the heavier traffic and turning movements that it will carry. Since the existing Park Avenue can adequately handle existing and future traffic, the Department of Highways believes the City should pay the cost of the reroute around the Mall.

The cost of improvements for the one-way portion of Park Avenue, including the reroute around the Mall, is estimated as follows:

1. Rebuild five block section around Mall	\$190,000
2. Sign System	<u>55,000</u>
	\$245,000

Park Avenue Widening

The September, 1972 public hearing discussed the widening of Park Avenue from Larch Street to the beginning of the one-way couplet of Park Avenue and Commercial Street. The Department of Highways proposed to widen the street to provide four lanes plus parking lanes and a variable flush median lane. Curb, gutter and sidewalks will be provided as part of this project. A modern traffic signal may be warranted to enable school-age pedestrians to cross the Park Avenue.

With the completion of this project, a full four lanes will be provided for this arterial highway through the entire length of Anaconda. The cost of this project is estimated to be \$610,000.

Four to Two Lane Transition

At the west city limits the wide four lane Park Street meets the two lane rural highway. An adequate transition section is needed at this location. Figure IV-13 illustrates a type of transition which will provide a smooth transition. This improvement will promote safe operation and reduce congestion and confusion. The estimated cost of this improvement is \$13,000. This project could be combined with the project to reroute Park Avenue around the Mall.

West Park Avenue Improvement

The wide four lane section of Park Avenue from Evergreen to Larch Street is in need of repair. The pavement has deteriorated because the surface drainage is inadequate. Private driveways have been constructed without proper drainage and the curb and gutter is in poor condition in various locations.

New curb and gutter need to be placed. A storm drain system needs to be installed so as to drain the section. The bituminous pavement may need to be reconstructed.

TWO TO FOUR LANE TRANSITION AND INTERSECTION PARK AVENUE - TRUCK BYPASS

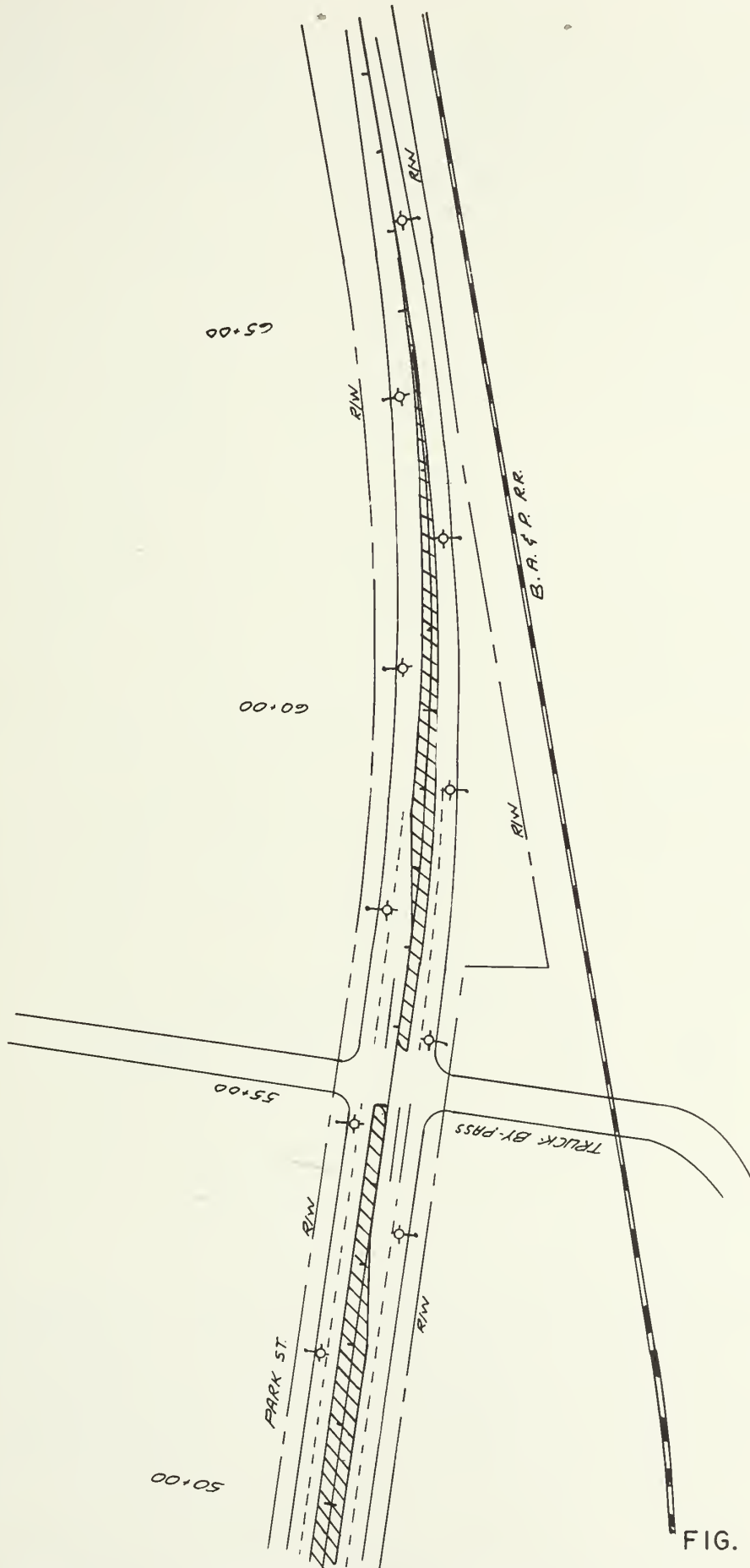


FIG. IV-13

Street lighting should be installed as part of the construction or reconstruction of any arterial street. This section of Park Avenue is not now lighted; therefore, lighting should be included. The estimated cost of this project is \$490,000.

WEST VALLEY HIGHWAY

The Deer Lodge County Comprehensive Plan recommended improvement of U.S. 10A West of Anaconda. This highway is classified as a minor arterial, providing traffic service for the West Valley, Georgetown Lake area, and connecting to the Skalkaho highway, and to Interstate 90 at Drummond. The West Valley had a population of 2,626 in 1970. It was the only segment of the county to show an increase in population from 1960. Approximately 1,000 people living in 268 households must use U.S. 10A as their primary access to Anaconda.

This highway serves a significant volume of traffic destined for recreational areas such as Georgetown and Silver Lakes, Pintler Wilderness Area, Discovery Basin Ski Area, and Forest Service campgrounds in both Beaverhead and Deer Lodge National Forests. This recreation traffic causes high demand during weekends and evenings.

An accident analysis of U.S. 10A from the Anaconda West City limits to four miles west was made for the years 1969 thru 1973. The summation of these accidents is shown in Table IV-5.

TABLE IV-5

ACCIDENT HISTORY - 1969 - 1973

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>Total</u>
Total	15	7	13	14	5	54
P.D.O.	8	2	5	5	3	23
Injury	6	5	8	5	2	26
Fatal	1	--		4	--	5

Approximately 60% of the accidents occurred during the weekend indicating a high involvement of recreational traffic. About half of the accidents involved collisions of through vehicles with vehicles

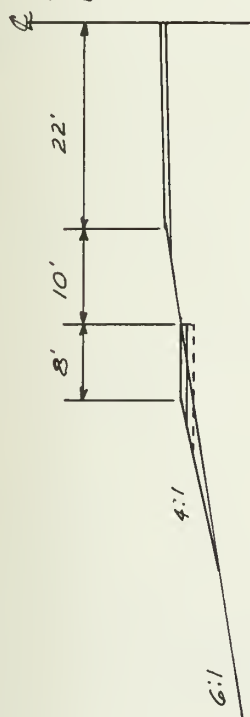
turning on or off the highway at the 57 approaches along this same four mile section. Only about one-half of a mile of this highway has frontage roads. The accident rate for this four mile highway for the last 5 years averaged 3.7 accidents per one million vehicle miles of travel. The state-wide average was 2.6 AC/M.M. for 1969 and 1970 and 2.4 AC/M.M. for 1971.

Traffic volumes for this highway for 1973 are 6200 ADT at the west city limits and 1720 ADT at a point east of the Anaconda Saddle Club (mile post 12.50). The 1990 traffic volume is expected to be an average of 5200 vehicles per day.

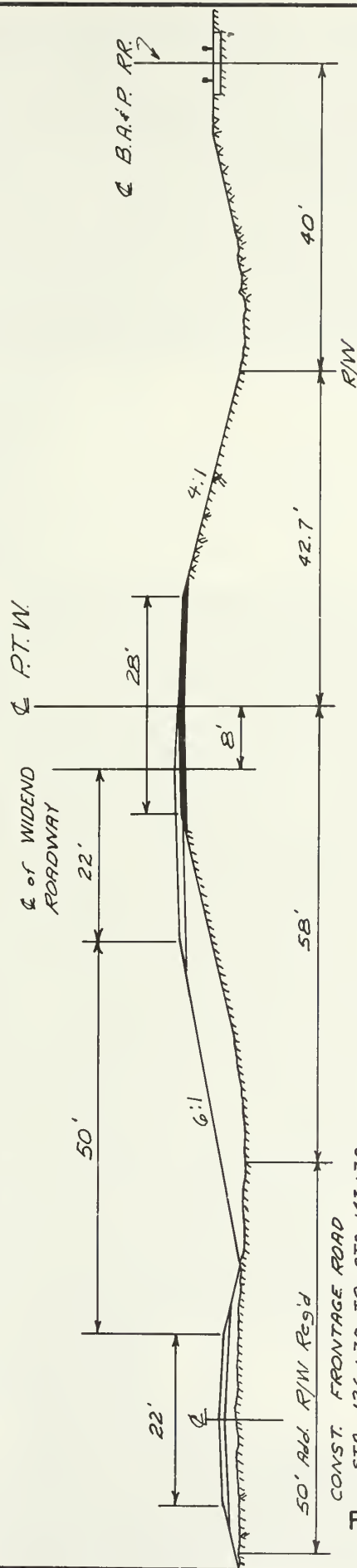
The Deer Lodge Comprehensive Plan recommended that the West Valley Highway be widened to four lanes or widened to a proper width two-lane with frontage roads and or bike paths where appropriate. The projected traffic volume of 5200ADT would justify a two lane width of 44 feet. Frontage roads should be extended easterly from the existing frontage road, 1700 feet on the south side and 2600 feet on the north side of the highway. It is proposed to widen the existing 28 foot highway 16 feet on the south side to facilitate construction and maintenance of traffic during construction of the proposed widened highway with frontage roads and the combination walkway and bikeway as illustrated in Figure IV-14 and itemized in Table IV-6.

The construction of a frontage road on the south side would require the acquisition of an additional 50 feet of right-of-way. It is proposed that the county construct the extension of the frontage road north of the B.A. & P. Railroad Lime Quarry Spur. An eight foot combination bikeway and walkway should be constructed on the southside from the east end of the frontage road into the existing sidewalk along the southside of Park Avenue a distance of 7500 feet. This walkway and bikeway can be constructed

PROPOSED TYPICAL SECTIONS TWO LANE WEST VALLEY HIGHWAY



WALKWAY AND BIKE PATH
STATION 67+70 to STATION 126+30



WIDEN EXISTING ROADWAY
STA. 50+70 TO STA. 283+30

CONST. FRONTAGE ROAD
STA. 126+30 TO STA 143+30

FIG. IV-14

WEST VALLEY HIGHWAY

LEGEND

- NEW FRONTAGE ROAD
- NEW WALKWAY & BIKE PATH
- APPROACHES (proposed to close)

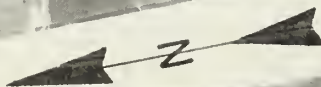


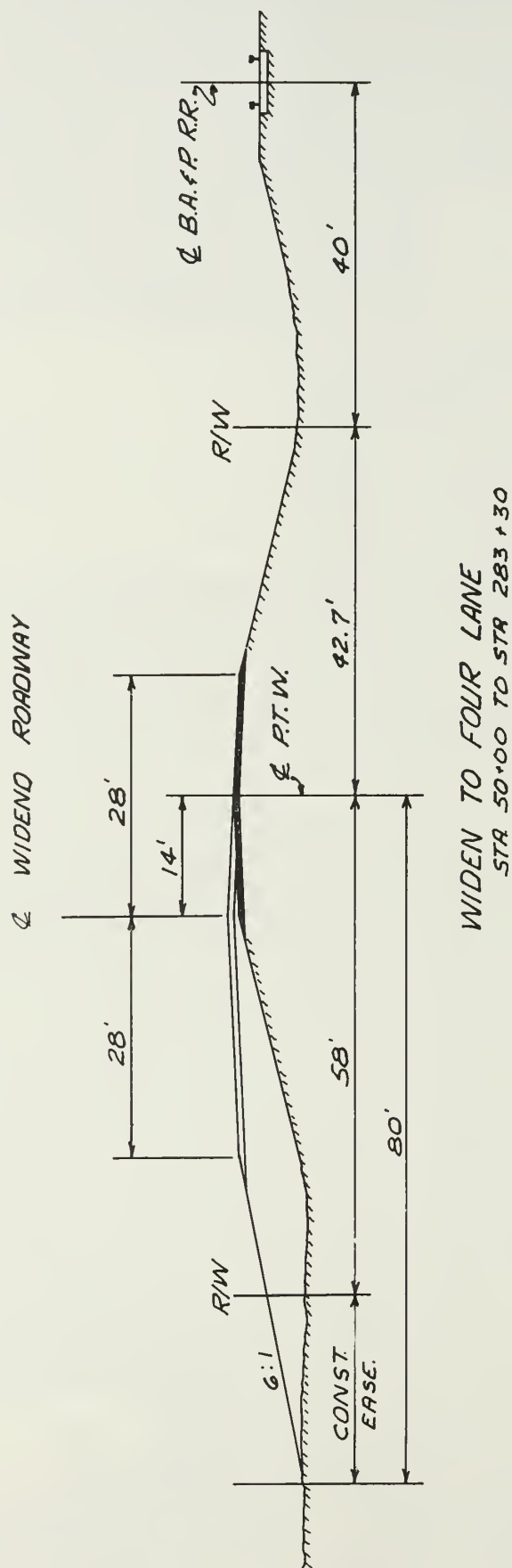
FIG. IV-15

within the existing right-of-way as part of the widening of the existing highway. See Figure IV-15 for the alignment of these proposed improvements.

TABLE IV-6
CONSTRUCTION AND RIGHT-OF-WAY COST ESTIMATE
TWO-LANE HIGHWAY WITH FRONTAGE ROAD

I. Widening Existing Highway to 44 foot width			
Grading:	\$93,000		
Drainage:	4,000		
Bridge-Warm Springs Creek:	48,000		
Paving:	<u>227,000</u>		
	\$372,000	372,000	
II. Frontage Roads			
Right-of-way: 2AC x \$2000/AV	\$4,000		
Grading:	3,500		
Paving:	16,200		
Approach 14 x \$800/APP	<u>11,200</u>		
	\$34,900	34,900	
III. Walkway & Bike Path			
Grading:	\$3,100		
Paving:	<u>13,300</u>		
	\$16,400	16,400	
IV. Approaches:			
(57-14)	=	\$34,400	<u>34,400</u>
Engineering & Contingencies + 25%			+ 457,700
			<u>114,400</u>
			\$572,100

As an alternate to the widened two-lane highway with frontage roads, a four lane highway was investigated. Four lanes with two, four



PROPOSED TYPICAL SECTION FOUR LANE WEST VALLEY HIGHWAY

foot shoulders (56 foot roadway width) is proposed as illustrated in Figure IV-16. For those areas where the right-of-way width on the left or south side is less than 80', it will be necessary to secure construction easements. Widening is proposed on the left or south side to facilitate construction and maintenance of traffic during construction.

The four lane section within the existing right-of-way, with construction easements where necessary, could not have access control. All lanes would be subject to decelerating and accelerating vehicles.

The construction and right-of-way costs are illustrated in Table IV-7.

TABLE IV-7
CONSTRUCTION AND R/W ESTIMATE FOR
FOUR LANE HIGHWAY

Grading:	\$136,000
Paving:	330,000
Bridge:	66,000
Approaches: 57 x \$800/APR	<u>45,500</u>
	577,500
Engineering and Contingencies - 25%	<u>144,400</u>
	\$721,900

CHAPTER V

PLAN IMPLEMENTATION

Chapter V

P L A N I M P L E M E N T A T I O N

The previous chapters of this report have been concerned with the development of a transportation plan which will meet future travel needs in a systematic manner, rather on a crisis basis. Chapter IV outlined recommended projects with their cost and priorities. The following discussion will outline the possible sources of funding to construct the projects outlined in this plan.

Funding Sources

There are four sources of funds available for construction of the recommended improvements: federal, state, county and city. Federal funds are derived from highway user taxes. The Federal Highway Act of 1973 apportions federal funds for the next three fiscal years, July, 1973 through June, 1976. However, there is no guarantee that Montana will receive all the funds allocated by the Act. As of June 1, 1974, previously allocated funds amounting to fifty million were being withheld by the Administration.

State road user taxes are used to match available federal funds. Two types of federal funds may be used for construction or reconstruction of streets within the urban area of Anaconda. Urban extension funds may be used on streets that are the extensions of rural primary highways through the urban area, U.S. 10A in the case of Anaconda. Urban funds may be used on streets that have been designated as the urban system by local officials.

Assuming that the level of funding of the federal highway program remains at the present level and that the funds apportioned can be obligated, Anaconda can expect the following amounts of state and federal funding in the next ten years: \$1,040,000 in urban extension funds and \$1,993,000 in urban funds. In addition, state gasoline tax in the amount of \$315,000 will be available to Anaconda in the next ten years. The city can use its property tax authority to raise funds for street improvements.

Review of Plan

If the assumed funding level stays constant, then the recommended projects described in Chapter IV can be constructed within a twenty year period. The plan should be reviewed periodically to assure that it still expresses the needs of the community or if the plans priorities need to be revised because of a change in funding conditions or community attitude.

ANACONDA TRAFFIC STUDY

PROJECT COSTS AND AVAILABLE FINANCES

TABLE V-1

Project	Priority	Urban Extension	Urban	Rural Prim	Other
A	1	610,000			
B	2				6,400
C	2	22,450			
D	2	13,000			245,000
E	4		1,904,700		
F	5		260,000		
G	3			1,095,000	
H	7		735,000		
J	6	490,000			
K	8		980,000		
L	9	518,000			
TOTAL		1,653,450	3,879,700	1,095,000	251,400
Expected Maximum Revenue 1974-83		1,040,000	1,811,000	?	315,000*
Difference		613,450	2,068,700		+63,600

* City Gas Tax Fund

